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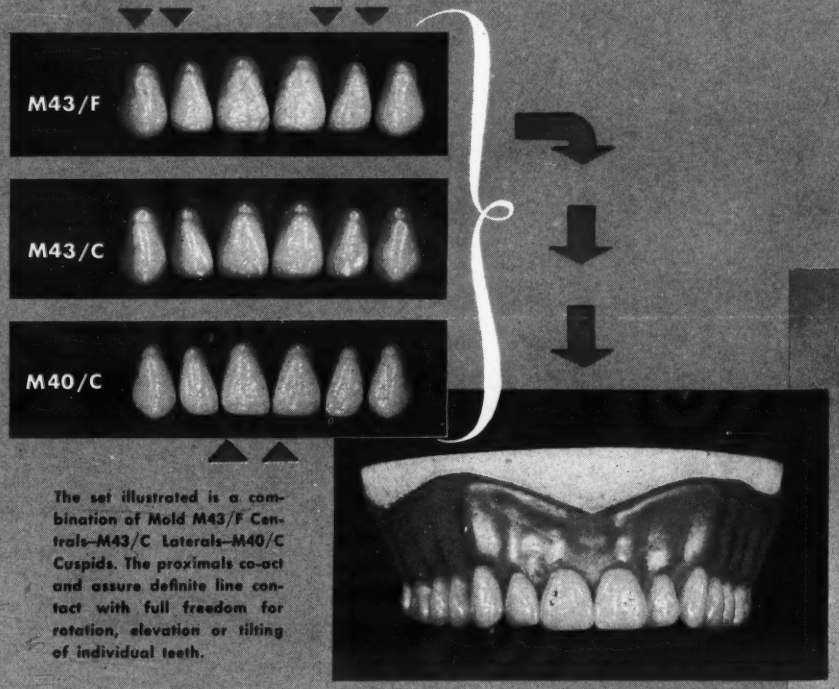
Since 1940—these varied labial surfaces and co-acting proximals created personalized dentures...



The set illustrated is a combination of Mold M43/F Centrals–M43/C Laterals–M40/C Cuspids. The proximals co-act and assure definite line contact with full freedom for rotation, elevation or tilting of individual teeth.

The introduction of the lifelike anatomy of Five-Phase Anteriors was based upon extensive studies of varied labial surfaces and for the first time, tooth forms were classified *scientifically* by dominant labial character.

Since then, Doctors select Five-Phase Anteriors by labial character (dominantly Curved "C," Flat "F" or a combination of both), to *recreate* in a denture the individual character of the dentition.

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JULY 1951

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About Our CONTRIBUTORS

Russell C. Wheeler, D.D.S. (Washington University, School of Dentistry, 1919) specializes in mouth rehabilitation in his practice and has a distinguished reputation as a teacher, having been a member of the teaching staff of Washington University, in St. Louis, since 1924. Doctor Wheeler has contributed many articles to dental literature, has published two books, A Textbook of Dental Anatomy and Physiology, and Tooth Form Drawing and Carving, and has contributed a chapter to Trapazzano's Review of Dentistry for State Board Examinations. Figures 6, 7, and 8 in Doctor Wheeler's article, Extension for Prevention vs. Conservation for Use, which appears in Digest this month, are from the second edition of his textbook, published in 1950.

Balint Joseph Orban who received medical degrees from the University of Budapest and the University of Vienna, and who graduated from Northwestern University Dental School is an authority in periodontics and has published almost 140 articles on this and related subjects. The material in Doctor Balint's article, Biologic Principles in Periodontics, the second installment of which appears this month, was presented at the second Mid-Atlantic States Seminar in Oral Medicine at Skytop, Pennsylvania, November 5-10, 1950.

Doctor Meyer M. Silverman who graduated from Georgetown University and practices dentistry in Washington, D.C. presents in this issue the concluding section of his two-part article, Accurate Measurement of Vertical Dimension By Phonetics and the Speaking Centric Space.

T. S. Malson, D.D.S. (Western Reserve University, School of Dentistry, 1923) will be remembered for his article in the February 1950 issue of Digest on the use of acrylic as a restorative material. This month Doctor Malson presents Shell Crown—An Anatomic Reproduction, a step-by-step description of a technique which the author has found extremely useful.

EDWARD J. RYAN, B.S., D.D.S., Editor
WANDA T. PICKARD, B.A., Assistant Editor
708 Church Street, Evanston, Illinois

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EXTENSION *for Prevention*

vs. CONSERVATION *for Use*

RUSSELL C. WHEELER, D.D.S., St. Louis

DIGEST

In operative dentistry much emphasis has been placed on the prevention of future caries in individual teeth by the radical extension of cavity margins, and too little emphasis has been placed on the possibility of loss of function as a direct result of radical procedure.

The discussion in this article is intended to stimulate those interested in operative dentistry to consider a new point of view in the planning of cavity preparations.

Diagnosis Governed by Requirements

The fundamentals of cavity preparation are not to be discarded. All the rules are to be observed except those arbitrary rules for radical extension into healthy tissue which may be contraindicated. In this respect dental surgery is subject to the same boundaries as general surgery. Conservative treatment is to be given first choice when indicated, and radical surgery is to be practiced only when it seems necessary. The requirements of the case should govern the diagnosis.

Consideration for Treatment—When a dentist presents himself for treatment, he wants to be the recipient of correct operative dentistry but usually he wants the minimum cavity extension for the following reasons:

1. The operation will take less time and afford less discomfort.
2. He wants as little disturbance of the natural condition in his mouth as possible.
3. He expects to watch his mouth carefully and observe known rules of prevention, which include periodic examination.

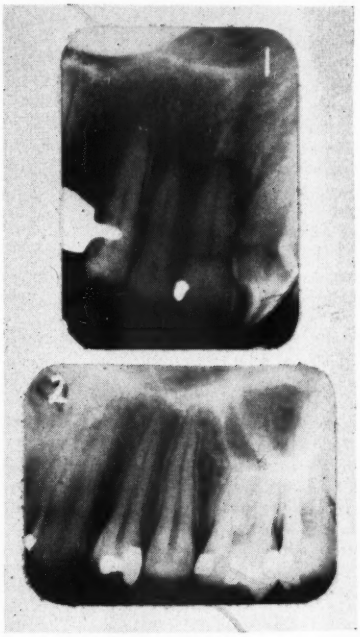
Patient Consideration—The patient merits the same consideration as that required by the dentist. If it is thought (1) that the patient will cooperate in treatment by observing the simple rules of mouth hygiene, which include periodic dental prophylaxis and examination, and (2) that the patient will follow advice on general health when nutritional or functional disturbances are involved, the patient should receive the benefit of conservative treatment.

Evolution of Dental Practice

The practice of dentistry is not pursued in the same manner that it was forty or fifty years ago or even twenty years ago. A certain amount of ground work must be done in acquainting patients with the rules of mouth hygiene and their responsibilities in taking care of their own mouths.

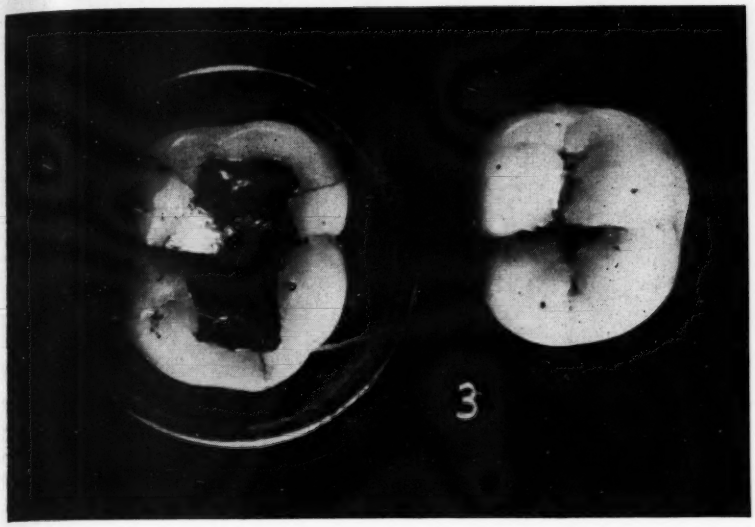
Initial Steps—The dentist must supply the first momentum by giving the patient the definite impression that he believes what he says: (1) A thorough dental prophylaxis should be given first, (2) prophylaxis should be followed by complete mouth radiographs, and (3) the patient must be informed regarding proper tooth brushing and home care. Without these preliminaries, suggestions on mouth hygiene will be quickly forgotten because an actual impression on the patient's consciousness will not have been made.

Radical Surgery Insufficient—Preventive dentistry can not be practiced



1. ***X-ray of maxillary anterior teeth illustrating small gold foil in distal of central. In place many years—nicely finished—no recurrence of caries and none in contacting lateral incisor.***

2. ***X-ray illustrating the following details: 1. Amalgam restoration in mesial of first molar; obviously placed before eruption of second bicuspid. 2. No recurrence of caries although lesions have appeared elsewhere in adjoining teeth. 3. The restorations in other teeth show proper form and finish of embrasures and contacts.***



3. ***View of conservative and radical occlusal restorations in molars. If the larger restoration was made unnecessarily, it is easy to see how the operator multiplied his difficulties and jeopardized results by increasing the length of outline and margin ten-fold, not to mention the likelihood of a change in occlusion function.***

by means of radical surgery. (1) To reach for the dental engine as soon as the patient is seated, (2) operate on the tooth, (3) pursue a brief pleasant conversation, and (4) dismiss the patient with no further thought of his dental future, is not the technique of conservative treatment. The patient's awareness of his responsibility in conservative treatment will have to be stimulated by the dental advisor. The *patient* must assume some of the responsibility for the future of his own mouth and teeth. *He* must practice proper mouth hygiene at home and seek dental service periodically.

The Dentist's Responsibility—Proper dental service must be applied when it is required and the dentist must ensure that the patient is fully informed concerning the latest knowledge in preventive measures. I, for one, do not think that the dentist is justified in anticipating the worst and in radically removing functioning tooth tissue on the theory that some day the patient might have another carious attack in the area near the involvement. Experience has shown that there is just as strong a possibility that he will *not* have a recurrence in the area.

Consequence of the Loss of a Tooth—Often teeth are removed or radical operations are made upon individual teeth without considering the ultimate cost to the patient through loss of valuable tooth tissue.

The loss of a single tooth in the dental arch may put the remaining teeth in jeopardy. In direct ratio to the extent of damage, the loss of one or more areas of a single component in the arch is serious.

Two Primary Functions—The teeth have two primary functions which are made operative by their form and alinement: 1. They serve as instruments in the comminution of food. 2. The teeth possess the ability to help preserve themselves and their foundation tissues by means of their form and alinement.

If the alinement of the dental arch is changed because of damage to one or more components, the teeth are not stable in the arches and costly deterioration of the masticatory apparatus is under way.

Lost Tooth Tissue Cannot Be Restored

The more the complex forms of the human teeth are studied, the more the operator hesitates to perform radical operations upon them because the lost part or parts must be restored. Nature is unable to restore lost tooth tissue. For this reason, no more of the tooth in an individual case should be removed than necessary for complete treatment. The conscientious operator will ponder seriously his ability to restore completely the lost part to original functional form. The complicated physiologic anatomy of the tooth should be disturbed as little as the case will warrant so that in the future the rest of the teeth will not be affected adversely by that member.

Value in the Conservation of Healthy Tooth Tissue—Extensive carious lesions are not being considered when advocating small preparations. In all cases caries must be entirely removed; the resultant destruction in extensive cases will automatically require radical treatment.

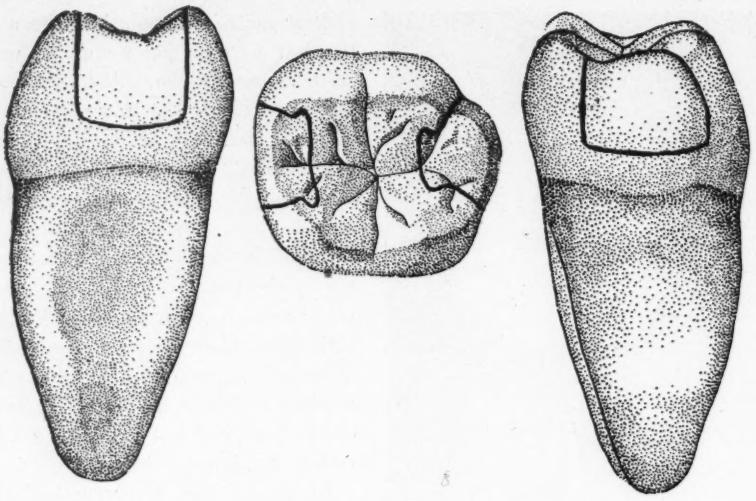
It might be argued that the radical extension is safer in the average operator's, or the student's hands. This premise cannot be verified for the simple reason that the difficulty in making a proper restoration is in direct ratio to the amount of functional anatomic form removed. If very little tooth substance is removed it is easier to restore the missing part, using the main section of the tooth as a guide.

Conservative Cavity Preparation Simpler—If all of a proximal surface is removed it requires considerable skill to restore the entire proximal surface and most of the occlusal surface with the involved marginal ridge, proper occlusion, and escapement space. Therefore, the more conservative the cavity preparation the simpler it is for the student or less skilled operator to make satisfactory restoration of the missing part.

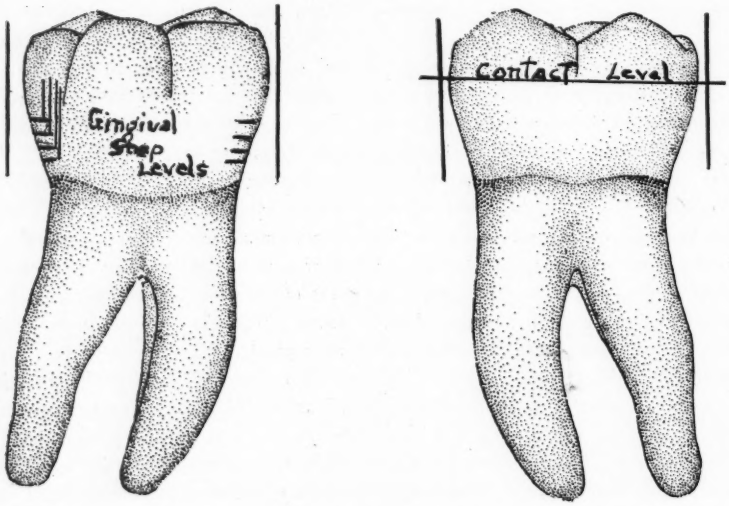
Adaptations of Traditional Techniques

Doctor G. V. Black, whose principles are accepted, as recorded, after fifty years, advocated certain procedures in dental therapy.

During the last thirty-five years changes in dental principles include (1) added knowledge in the basic sci-



4. ***Outline of restorations for contact caries when the occlusal surface is not involved. Interproximally extension is limited to the carious lesion plus the smallest outline beyond to facilitate proper finish. This obviates the danger of changing the functional form of approximal surfaces and the occlusal design.***



5. ***Buccal and lingual aspects of a mandibular first molar. Markings will show how a lowering of gingival level below contact area complicates conditions. The functional restoration generally is made more difficult in direct ratio to the lowering of the level.***

The vertical lines represent matrix material (bands or metal matrixes). The lines serve also to show the rather extreme curvature of the approximal areas and the difficulty of restoring with carved wax or the adaptation of matrixes.

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ences applicable to dentistry, (2) new techniques and materials, and (3) a considerable change in the attitude of the public toward the importance of dental care and a definite awareness in many people of the value of preventive measures.

Doctor Black's ideas were adapted to his time. He favored methods that would pay immediate dividends; radical extension of some tooth preparations to ensure satisfactory technique with the materials available in the attempt to ensure the life of the teeth in the mouths of a public uneducated in dental hygiene and preventive dentistry.

Treatment of First Importance—The dentist at that time was primarily interested in treatment and not prevention as it is understood today. At present the dentist is more conscious of (1) the physiologic form of the individual teeth, (2) their alinement, and (3) the bearing these fundamentals have upon the sustained health of the periodontium. Preventive measures currently accepted were not common knowledge in the profession fifty years ago and certainly the public was not aware of them.

Progress in Orthodontics and Periodontics—Specialists in orthodontics and periodontics are leading the profession in the study of occlusion and stabilization of the dental arches. Specialists in these fields realize the complexity of the problem: 1. They know how easy it is for the occlusion to be thrown out of balance by small maladjustments. 2. They know how difficult it is at times to secure cooperation from general practitioners in making proper restoration of teeth and parts thereof which will ensure the success of special treatment. 3. They know that if restoration of tooth form does not conform to the anatomic norm their execution will be jeopardized because the offending teeth cannot be stabilized.

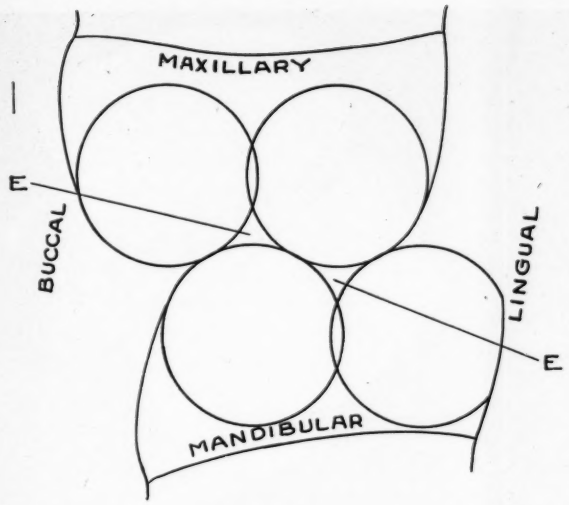
Constructive Changes in Technique

In advocating liberal extension of cavity outlines Black included other possibilities besides creating a safeguard against future trouble in the involved areas:

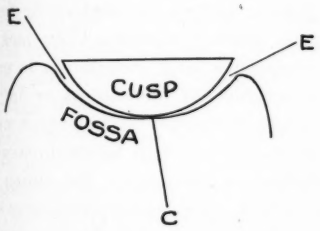
1. The principle would allow greater standardization of technique than had existed previously. All cavities could be brought under five classifications.

2. The materials used were gold foil and silver amalgam with special emphasis on the former. The manipulation of foil was facilitated by adequate access to all margins and angles during condensation procedure and the finishing of margins.

3. The standardization of tech-



6. *Schematic drawing of the mesial aspect of first molars in occlusion, illustrating the cusp forms as perfect circles. With this arrangement, escapement spaces would be larger, but the centric occlusal relation would be too unstable and the cusps would be too flat. Also, "mortar and pestle" activity, where indicated for efficiency, would be absent. E, Escapement spaces.*



7. *Schematic drawing of "mortar and pestle" design of some of the occlusal contacts of the teeth. Examples: buccal cusps of mandibular molars in contact with central sulci of maxillary molars; incisal ridges of mandibular incisors in contact with lingual fossae of maxillary incisors. C, Contact. E, escapement.*

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nique and ease of procedure with gold foil were probably the points emphasized with the theory of extension for prevention a secondary consideration.

Comparative Techniques—A significant comparison of cavity outlines is that of a preparation for a proximal foil or class 3 cavity compared with a preparation for a mesio-occlusal or a disto-occlusal restoration on a posterior tooth which was called class 2:

1. Both cavities were of carious lesions of contact areas. Yet the class 3 was prepared just large enough to take care of the lesion on an anterior tooth and to gain access for condensation of gold foil.

2. No attempt was made to extend it to cover all of the proximal surface for possible prevention of future disease.

3. The class 2 cavity was not only extended to include most of the proximal surface but also to take in all of the developmental and supplemental grooves of the occlusal surface and occlusal tissue half way up the cusp slopes. This preparation might be given as a true example of the extension of margins for the inclusion of vulnerable areas.

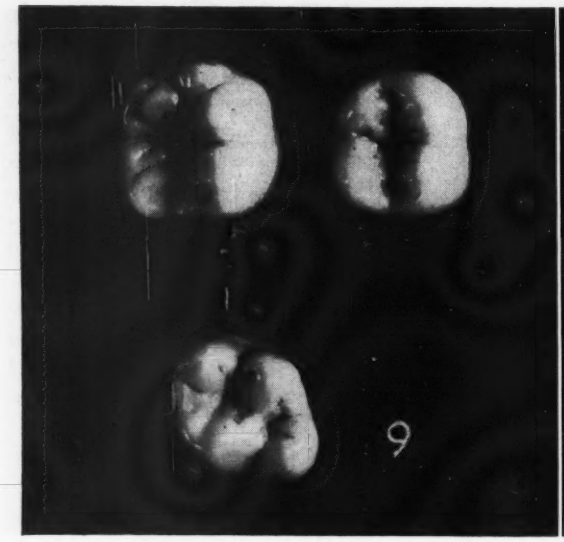
Radical and Conservative Treatment—Why extend the margins so radically in one and not the other, if extension for prevention was paramount?

This appears to be the common denominator between radical and conservative treatment which supports the theory of those who wish to be more conservative in the removal of tooth tissue in modern dental therapy.

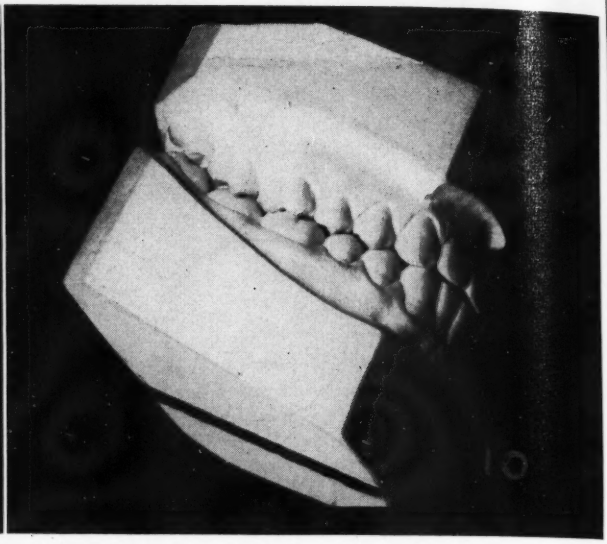
Why is there rarely a recurrence of caries around a perfectly condensed and perfectly finished foil restoration in a class 3 cavity?

Because (1) the restoration is perfectly finished at the margins, and (2) because the extension barely beyond the contact area is all that is required as the contact area is the only vulnerable area on the proximal surface that is significant and

8. *A cast of the mandibular teeth showing the occlusal contact with the opposing arch. The side with markings on buccal cusps only shows the contacting points for this individual in lateral occlusal relation. The side with the greatest number of markings shows the contacting points for this individual in centric occlusal relation. All of the occlusal and incisal surfaces showing no markings were out of contact during the occlusal relations.*



9. ***Occlusal aspect of occlusal surfaces of molars in use many years. How many dental operators could restore these in the same manner?***



10. ***Right lateral occlusal relation demonstrating the opening of escapement spaces.***

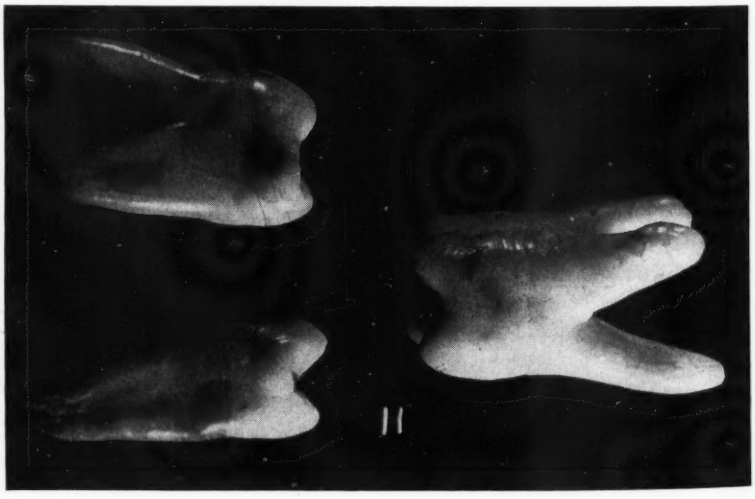
prevalent under normal conditions.

Limited Periphery—It should be permissable to design cavity preparations on any tooth involving the contact are with a periphery limited to an area slightly larger than the contact area *provided* a finished restoration is possible which will compare favorably with that of a class 3 gold foil. If it is impossible to execute a restoration that small, in a posterior tooth for example, the extension should be limited as much as practicable in order to attain retention and proper finish.

Careful Evaluation in Diagnosis—I can see no reason why all of the developmental grooves in the occlusal surface of a posterior tooth should be ground away because an explorer has been able to penetrate one or two small pit areas. It is assumed that a careful evaluation will be made in diagnosis. If the calcification looks faulty, or if the patient seems to be unusually susceptible to dental caries, that is another matter. But if the tooth has gone along for a reasonable length of time with the developmental grooves intact, conservative treatment should be a good risk, allowing the functional occlusal contours to remain.

Procedure—The cavity in each instance is extended just far enough (1) to allow the caries to be removed, (2) to allow proper finishing of cavity walls, (3) the insertion of a gold inlay or amalgam restoration, and (4) to permit the final polishing and finishing of the completed restoration.

Proper Finish Important to Successful Treatment—There is sometimes a tendency to neglect the finish of a small restoration. The lack of finish on a large restoration is more noticeable but the success or failure of any restoration is dependent upon the excellence of its finished margins. Earlier in this article the finish on gold foil, class 3 restorations was emphasized in proving the practicability of cavities with minimum extension.



11. ***Three approximal forms differing widely in design. How would you reproduce these with a stiff matrix band?***

Illustration—A small proximal restoration of amalgam in the mesial surface of a first molar could only be placed before the second bicuspid was erupted and in contact. The open space in front of it allows proper finish. As a consequence, caries around it will be unlikely, and the smoothness of its surface helps to ensure the adjoining tooth in contact with it. This is further proof that contact restorations under any circumstances need to be extended only as far as necessary for the completion of technique in order to achieve proper restoration. As it is impossible to limit contact restorations under ordinary conditions to the extent described, the point discussed is that ingenuity should be used to develop techniques whereby efficient restorations may be made extremely small even when part of the marginal ridge has to be included.

Problem: Why is it considered important that compound restorations involving the mesial or distal marginal ridge be kept small? It requires little additional time and effort to enlarge the preparation after the marginal ridge has been penetrated. The operator is confident that he can restore the functional form, including all the marginal ridge and most of the approximal surface and liberal extension facilitates success.

Discussion: It is most important that all partial restorations of individual teeth be kept small because the functional form of the tooth is of utmost importance. The smaller the restoration, the easier it is to conform to the natural form which has remained almost intact. The ability of the operator to restore anatomic form to its original excellence is not being challenged. However, because of so many circumstances that are beyond control it is being questioned.

Physiology and Anatomy

Insufficient emphasis has been placed on the functional form of the proximal areas of posterior teeth which includes contact levels and escapement space. A brief review of the physiology and anatomy of some specific areas which are often involved in daily practice is useful:

1. A vexing problem universally encountered is the contact relation of maxillary first and second molars. In addition to the variation in the form of these two areas (1) the normal contact level, (2) the contact design, and (3) the escapement space created by occlusal and buccal and lingual embrasures must be considered.

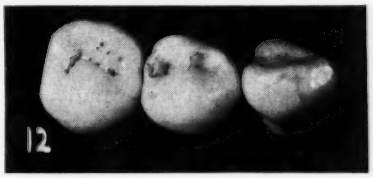
2. If there is caries present and one or both of the contact areas is involved, the problem is to complete the original form in restoration. The restoration of form and function is more important than extension of cavity walls to prevent caries which may never occur.

3. If the restoration is imperfect, future disease, caries or periodontal, is certain. The deep escapement spaces provided by the developmental grooves and sulci of the occlusal surfaces must not be overlooked.

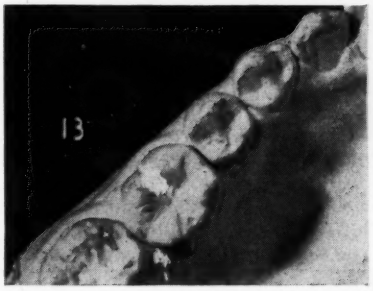
4. If the case permits, the extension of cavity outlines should conserve as much of the complicated form as possible, commensurate with removal of caries, proper cavity preparation, and finish of the restoration. Complete finish and polishing may require the use of separators if amalgam is the choice of material.

Basic Principles Still Sound

The ease with which restoration is accomplished is in direct ratio to the extent of destruction of form, whether it is due to caries or the hand of the dentist.



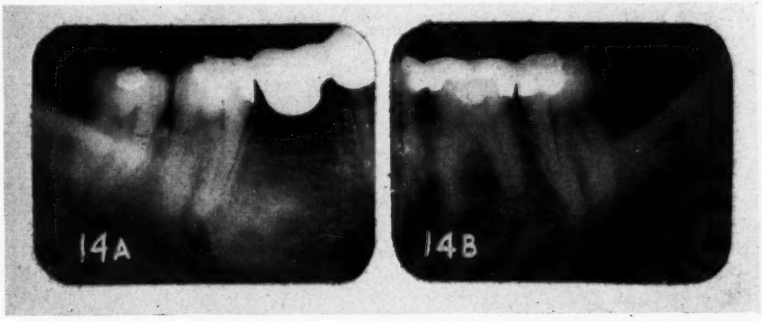
12. ***Occlusal view of three teeth (lower cuspid and bicuspids). Variation in contact and embrasure design in the same patient.***



13. ***Occlusal view of plaster cast of mandibular teeth showing wide variation in each contact relation.***

No criticism is made of Black's basic principles for cavity preparation. What is advocated is an adjustment and adaptation of Black's teaching to modern developments in dental practice.

Recommendations — The dental practitioner should regard the tooth as a functioning member because of its form and should reflect before he assails that form because he holds it in the highest respect and because he realizes his own limitations in restoring it.



14. ***(A) Correct contact and embrasure form between second and third molars. (B) Incorrect contact and embrasure form between second and third molars (marginal ridge and contact point too high).***

Definition—Black gave the following definition of a satisfactory cavity preparation: "Cavity preparation includes all those operations required in the removal of carious material from cavities formed in the teeth by decay, forming the cavities for the reception of fillings and such extensions and preparations as will best fit the affected surfaces of the teeth to resist decay in future."

Author's Definition—Cavity preparation includes all those operations required in the removal of carious material from cavities formed in the teeth by decay, forming the cavities for the reception of restorations and such extensions and preparations as will best *conserve the form and function of the teeth to resist future pathologic change, not only in their own structure but in their supporting tissues as well.*

With that definition it is evident that "lazy man's dentistry" is not advocated. Merely conforming to the principle of removing as little tissue as possible in operative procedure will not suffice.

Conclusion

If the functional form of a tooth is respected and associated with the future of the dental apparatus, radical treatment in cavity preparation will be considered only when (1) it is indicated by extensive lesions, or (2) in mouths highly vulnerable to dental caries.

In the diagnosis and prognosis of a case it devolves upon the operator to consider carefully whether margins shall be extended liberally, conforming to the principle "extension for prevention," or whether more tooth tissue shall be conserved, conforming to the principle, "conservation for use."

1201 *Missouri Theatre Building.*

Announcement of Books Received

OPERATIVE DENTISTRY, by William H. L. McGehee, D.D.S., M.D.; Harry A. True, D.D.S.; and E. Frank Inskipp, B.S., D.D.S., Third Edition, Philadelphia, The Blakiston Company. 1950, Price $10.00.

THE SURGICAL TREATMENT OF FACIAL INJURIES, by Varaztad Hovhannes Kazanjian, M.D., D.M.D., and John Marquis Converse, M.D., Baltimore, The Williams & Wilkins Company, 1949. Price $10.00.

NEWER CONCEPTS OF INFLAMMATION, by Valy Menkin, M.A., M.D., Springfield, Illinois, Charles C Thomas, Publisher, 1950. Price $3.50.

THE DIAGNOSIS AND TREATMENT OF ENDOCRINE DISORDERS IN CHILDHOOD AND ADOLESCENCE, by Lawson Wilkins, M.D., Springfield, Illinois, Charles C Thomas, Publisher, 1950.

TEXTBOOK OF PERIODONTIA (Oral Medicine), by Samuel Charles Miller, D.D.S., Third Edition, Philadelphia, The Blakiston Company, 1950. Price $11.50.

FUNKTIONELLE PROTHETIK, by Walter Wild, D.D.S., Basel, Switzerland, Imported by Grune & Stratton, Inc., New York, 1950. Price Fr. 20.

LEADERSHIP IN DENTISTRY—LABORATORY RELATIONS, by Alfred J. Asgis, M.A., Ph. D., D.D.S., Issued by the Joint Dental Trade and Laboratory Relations Committee of the First, Second, and Tenth District Dental Societies of the State of New York, 1950.

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Biologic Principles in PERIODONTICS

Part TWO

BALINT J. ORBAN, M.D., D.D.S., Colorado Springs

DIGEST

Proper classification of periodontal diseases is essential to correct diagnosis which, in turn, is a prerequisite for satisfactory treatment and prognosis.

The different pathologic changes which are the basis for the classification and diagnosis of periodontal diseases are presented in this article, the second in a series of three, in combination with etiologic factors and clinical features.

A Gingival Diagnostic Chart, to be used as a basis for routine examinations, is included.

Classification and Diagnosis of Periodontal Diseases

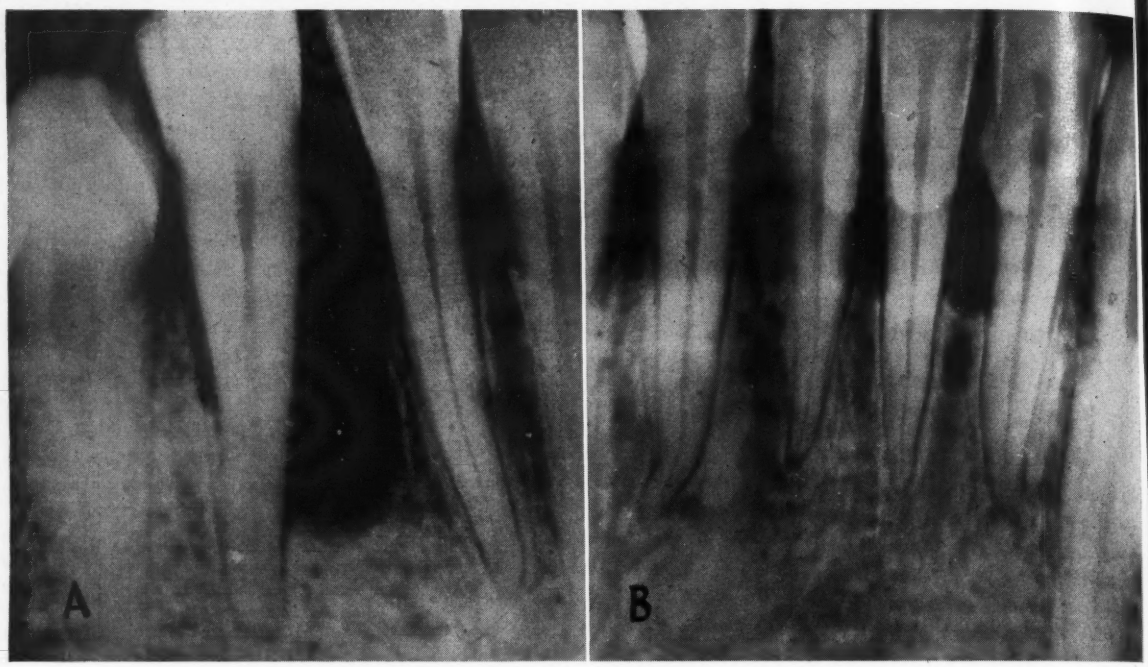
Under the term "periodontal diseases" are collectively classified all diseases affecting the supporting apparatus of the teeth. This supporting apparatus consists of the periodontal membrane, alveolar bone, and the gingiva, and is referred to as the periodontium.

In a broad sense, to the tissues mentioned should be added the cementum of the root which is the substance attaching the fibers of the periodontal membrane to the tooth. The proper vitality (quality and quantity) of the cementum is a most important feature of the physiologic functioning of the periodontium.

To classify any disease, pathologic changes in the tissues involved,

1. ***Three stages in the development of periodontosis: (A) Degeneration of periodontal connective tissue, widening of the periodontal space. No pocket formation. Inflammation in gingiva mild. (B) Proliferation of epithelial attachment (from pocket to area of resorption of tooth x-xx). No pocket formation, inflammation more extensive. (C) Pocket formation which was preceded by stages A-B. Pocket is isolated to one tooth and only the distal surface of this tooth.***

(Reproduced from Orban, Balint J., and Weinman, Joseph P.: Diffuse Atrophy of the Alveolar Bone (Periodontosis), J. Period. 13:31 (Jan.) 1942.)



2. ***Roentgenograms of (A) a case of periodontosis (vertical resorption) and (B) periodontitis (horizontal resorption) with ragged edges of alveolar crest.***

etiology, and clinical features must be taken into consideration. Periodontal diseases, therefore, can be classified as follows:

(A) Inflammatory
(B) Regressive
    1. Degenerative
    2. Atrophic
    3. Traumatic
(C) Productive

(A) *Inflammatory* conditions are generally designated by the suffix "itis."

Therefore, an inflammation of the gingiva is called *gingivitis.* If the inflammation penetrates into the deeper supporting tissues, bone and periodontal membrane, it is called *periodontitis.* These conditions can be further designated as acute or chronic, depending on the duration and type of inflammatory elements present in the tissues. According to the exudate, which is produced by the inflammatory reaction, a serous, purulent, or hemorrhagic gingivitis or periodontitis can be designated.

These conditions can be differentiated according to their location (1) as marginal, papillary, or attached according to their clinical appearance, (2) as ulcerative or hyperplastic, or (3) according to their etiology in general, as due to local or systemic factors. If the latter is known, differentiation, for example, may be made as scorbutic, tuberculous gingivitis, or gingivitis in pregnancy.

Gingivitis: The clinical differentiation between a gingivitis and periodontitis is mainly determined by the depth of the pocket. In gingivitis the bottom of the gingival pocket does not encroach upon the periodontal membrane.

Periodontitis: The pocket is deep and extends beyond the original alveolar margin which has been resorbed into the region of the former periodontal membrane. A periodontitis might be caused by neglect of a gingivitis or by some systemic disease. It also develops as a late symptom of periodontosis.

(B) *Regressive* changes are divided into: 1. Degenerative. 2. Atrophic. 3. Traumatic. A degenerative disease, a qualitative tissue change of the supporting tissues can be localized to the gingiva (gingivosis) or to the periodontal membrane (periodontosis). Gingivosis might appear in different forms and is characterized by connective tissue degeneration (depolymerization). It might develop in children (juvenile) or in grown-ups (adults) and can take different clinical forms, one of which is the disease formerly known as desquamative gingivitis. Periodontosis is known to develop in three stages:

1. The first stage is the degeneration of the connective tissue elements of the periodontal membrane, followed by resorption of the alveolar bone, leading to widening of the periodontal space (Fig. 1A).

2. In the second stage epithelial proliferation is evident in microscopic specimens, leading to a shifting of the epithelial attachment in an apical direction (Fig. 1B).

3. In the third stage, the epithelial attachment separates from the surface of the root and deep periodontal pockets develop. Because of the connective tissue degeneration and bone resorption, granulation tissue develops in the widened periodontal membrane, causing the teeth to shift and wide spaces to appear between the teeth affected. The deep pockets develop on the side from which the teeth migrate (Fig. 1C).

In the roentgen picture periodontosis is characterized by development of intrabony pockets (Fig. 2A) due to vertical type of bone resorption, and periodontitis (Fig. 2B) as horizontal bone resorption due to penetration of inflammation into the bone marrow.

Various Regions Attacked: This disease often attacks people immune to caries, usually it affects women at an earlier age than men. It might involve one tooth or a group of teeth, one central incisor, or the first permanent molars, and sometimes only one root of a multirooted tooth.

Etiology: As yet the etiology of periodontosis is not fully understood but it may be assumed that systemic disturbances of different natures (organic, nutritional) are of primary importance. An inherited organ inferiority of the dental supporting apparatus must also be assumed. Local factors seem to be of secondary nature and are mostly superimposed.

Atrophy (quantitative tissue change) manifests itself in the supporting tissues as gingival recession, which appears as a simultaneous alveolar bone and gingival atrophy.

From the dental point of view disuse atrophy is of great interest. It develops from loss of occlusal function and leads to resorption of the alveolar supporting bone trabeculae, appearing as osteoporosis. The fiber bundles of the periodontal membrane disappear and are replaced by loose fibrous tissue without any principle fibers. The periodontal membrane becomes half or one-third as wide as in the functional condition.

Traumatic disturbances in the supporting tissues appear as traumatism, a morbid condition of the tissues produced by mechanical trauma. Among etiologic factors are the following: (1) Imbalanced occlusion is important. (2) Occlusal trauma may be *primary*, as in high restorations with restorations and crowns, or improper attachments or partial or removable fixed bridges. (3) Shifting of the teeth following extractions also belongs in this category. (4) *Secondary* occlusal trauma may affect teeth which have lost part of their supporting apparatus from inflammatory (periodontitis), degenerative (periodontosis), or atrophic (periodontal or disuse atrophy) conditions. For teeth so affected even normal occlusion is traumatic. They often shift their positions and become elongated; thus, secondarily, they come into positions in which they are traumatized (cusp interference).

(C) *Productive Disturbances.* Hyperplasia is an overgrowth of tissue caused by an increase in the number of tissue elements within an organ. It appears mainly in the gingiva. It might develop as an inflammatory condition, that is, adolescent hyperplastic gingivitis, or as a fibromatosis without inflammation. Dilantin sodium, a drug used in epilepsy to combat convulsions, causes a hyperplastic gingival tissue growth in approximately 50 per cent of the cases.

(*To be continued next month*)

629 *North Nevada Avenue.*

Gingival Diagnostic Chart

COLOR	Pink (Normal) Red Magenta Pale Pink
MARGINAL CONTOUR	Thin (Normal) Swollen Receded Irregular
PAPILLARY CONTOUR	Pointed (Normal) Blunted Flat Inverted
TEXTURE	Stippled (Normal) Glossy Pebbly Roughly Granular
CONSISTENCY	Firm (Normal) Turgid Boggy Dense
EXUDATE	None (Normal) Serous Purulent Hemorrhagic
POCKETS	None (Normal) Shallow (Normal) Moderate Deep

3. ***Gingival diagnostic chart. In description of a certain gingival condition a systematic description is necessary. If this chart is followed the actual condition can be visualized.***

Accurate Measurement of Vertical Dimension by PHONETICS *and the* SPEAKING CENTRIC *Space*

Part Two

MEYER M. SILVERMAN, D.D.S., Washington, D.C.

DIGEST

In this final installment of a discussion of a physiologic method for determining the vertical dimension as a means of eliminating failures in full denture construction, the procedure to be followed in the technique is described in detail.

Measuring Vertical Dimension

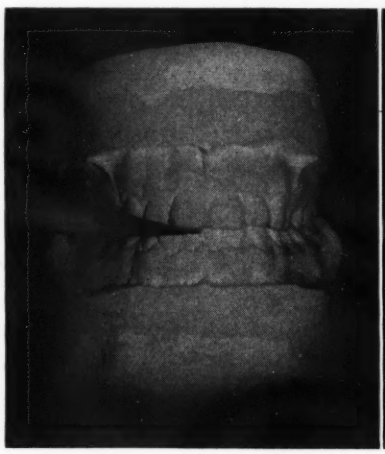
Determination of the patient's centric occlusion is the determination of the vertical dimension. *Measuring the speaking centric space is the means of measuring the vertical dimension as it supplies the natural centric occlusion.* It is a simple procedure and must be accomplished *before* all the remaining permanent teeth are removed. If the teeth are removed before the vertical dimension is measured, the true and accurate measurement will be lost and can only be regained through guesswork and subsequent shrinkage of tissue. As long as there are enough natural teeth and partial dentures in the mouth to maintain the normal centric occlusion relationship of the jaws, the vertical dimension can be measured.

Procedure—Vertical dimension can be determined on a patient in a matter of a moment or two and does not require any equipment or instruments. It can be recorded and rechecked by the dentist at a later date, and after the patient is edentulous the measurement can be duplicated by any dentist without relying on someone else's equipment.

The Centric Occlusion Line—Have the patient bite into centric occlusion with the upper and lower posterior teeth occluding in a normal manner. Draw a line with a pencil on one of the lower anterior teeth at the horizontal level of the upper incisal edges as shown in Figure 6. All the various speaking levels of the mandible are measured from this centric occlusion line.

The Speaking Centric Line—The line is drawn with a pencil while the mandible is on the speaking centric level (Fig. 7). The line is drawn on the same lower anterior tooth which has the penciled centric occlusion line, and is at the horizontal level of the upper incisal edge. This line is drawn while the patient has the mandible on the speaking centric level which is obtained when the patient pronounces the phonetic sibilants or hissing sounds, S, Z, SH, ZH, CH, or J. Words that the dentist can use are Yes, Buzz, Fish, Measure, Larch, Judge, or any words or sounds simulating the hissing sounds. It should be noted that the X (ks) sound as in box, as seen in Figure 1, is not classed as a sibilant, but the S of the KS is a sibilant sound. Therefore, the phonetic sound X, as in Box, could be used for practical purposes as well as any of the six sibilants listed.

Measurement for Vertical Dimension—The measurement of the speaking centric space is the measurement for vertical dimension. The speaking centric space is that space between the centric occlusion line and the speaking centric line which was drawn on the lower anterior tooth (Fig. 7). Speaking centric space may vary in different people from nothing to as much as 10 millimeters, according to data found on 208 patients



6. ***Marking centric occlusion line before loss of natural teeth.***

7. ***Marking speaking centric line before loss of natural teeth in order to measure the speaking centric space.***

analyzed in the author's practice (Fig. 8). During the analysis of many of these patients it was found that the determination of the freeway space was difficult and could not be relied upon.

Method—1. While marking the speaking centric line the patient must hold the mandible at the level caused by the hissing sound used. For example, if the word Yes is used, the penciled mark must be made while the S sound is made and held.

2. If the patient's movement of the mandible is stiff or closed tight, or closer than seems normal, the patient can be forced to relax the mandibular movements by pronouncing one of the wider speaking level sounds, such as O in *O*hio. The mouth opens wide and effort is again made to obtain the speaking centric line by pronouncing the proper hissing sounds. At this time the line is drawn.

3. It is often helpful to have patients say "Mississippi" which has many sibilants or hissing sounds so that it can be noted whether the speaking centric line is constant as drawn.

4. The most practical and reliable way to check whether the patient has supplied an accurate speaking line is to observe the patient speak or read rapidly, when the level of the mandible as the sibilants are pronounced, particularly the S sound, should be noted.

5. If the upper incisal edges coincide with the speaking centric line as drawn, it is evident that the patient gave a normal measurement.

6. When marking and checking the speaking centric line by using the sibilants of individual words or rapid speaking or reading, *the patient must always sit erect without the use of the headrest, with eyes forward* as shown in Figure 9. This position will usually cause the occlusal surfaces of the upper posterior teeth to be parallel to the floor. Speaking centric spaces should always be measured in this constant position as the tilt of the head forward or backward could affect the accuracy of this vitally important measurement when reexamining later.

Variations From Normal—If it is found that the sibilants or hissing sounds, S, Z, SH, ZH, CH, and J will not all cause the mandible to assume the closest level or speaking centric level of the mandible, test all the hissing sounds. If any one or more brings the mandible to the speaking centric level take the measurement and make a permanent notation on the record as to which sound was used.

Sibilants Used Routinely—Exceptions to the rule have been noted where other sounds have caused the mandible to assume a closer level to the maxilla than the usual sibilants or hissing sounds. In such cases the sounds responsible must be noted on the patient's record for future reference. In a total of 50 patients (Fig. 10) whose complete phonetic analysis was made it was found that some or all of the sibilants or hissing sounds caused the mandible to assume the closest level to the maxilla in 90 per cent of the cases. Because there were only 5 cases in which

Speaking Centric Space	*Number of Patients*
0	46
½ mm.	5
1 mm.	31
1½ mm.	13
2 mm.	28
2½ mm.	7
3 mm.	42
3½ mm.	3
4 mm.	17
4½ mm.	2
5 mm.	11
7 mm.	1
8 mm.	1
10 mm.	1

8. ***The variations of vertical dimension in 208 patients.***

9. ***Position of patient while marking and rechecking the speaking centric line.***

All six sibilants causing speaking centric	*One to five sibilants causing speaking centric*	*Other sounds (not sibilants) causing speaking centric*
32 cases	13 cases	5 cases
64%	26%	10%

90% of the closest speaking levels are caused by 1 to 6 of the sibilants or hissing sounds

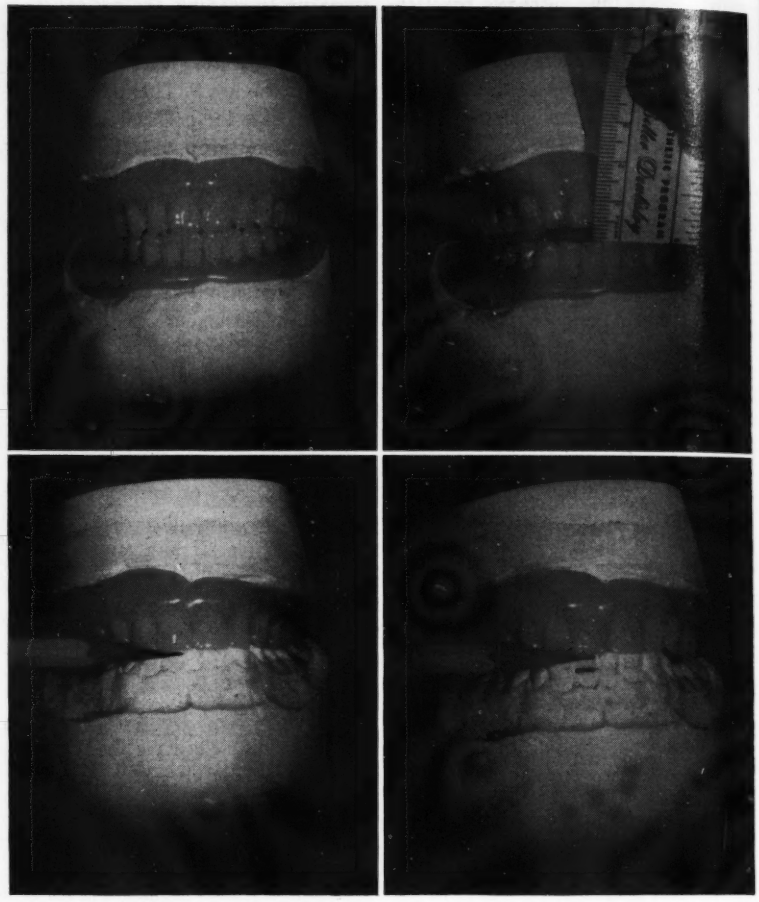
10. ***All the sounds causing the speaking centric level of the mandible of 50 patients.***

11. ***Centric occlusion of full dentures with teeth set edge to edge on a horizontal plane. The centric occlusion line is at the incisal edges of this edge-to-edge setup.***

12. ***The speaking centric space of the full dentures in Figure 11.***

13. ***The centric occlusion of a full upper denture placed in position against lower natural teeth.***

14. ***The speaking centric space of the upper full denture in Figure 13 is measured in order to duplicate the patient's normal centric occlusion. Note the centric occlusion line already drawn on the lower right central and the speaking centric line being drawn with a pencil on the same lower tooth.***



other sounds caused a closer speaking level of the mandible it is advisable to use the sibilants or hissing sounds routinely, because in these 5 exceptions the sibilants constantly recorded accurate vertical dimensions.

Measurement When There is no Overbite—In Figure 12 is shown the method of using a millimeter rule to measure the speaking centric space or any of the wider speaking spaces mentioned in this report when there is an air space between the upper and lower incisal edges during the various levels of the mandible. When this method of measuring in the patient's mouth is used there is no overbite of the uppers over the lowers in order to make the speaking centric line on the lowers.

Speaking Centric Space in Full Dentures

The speaking centric space of each patient is constant when measured under identical conditions of posture and vigor of speech with similar phonetic sounds that cause the mandible to assume the speaking centric level. By measuring the speaking centric space the patient's accurate centric occlusion can be established. Therefore, the vertical dimension can be measured in the natural dentition and reproduced in succeeding artificial dentures by maintaining the same speaking centric space.

Reproduction in Full Dentures Essential—After recording the speaking centric space of the natural dentition before the removal of all the remaining teeth, it is an absolute requirement that the same speaking centric space be reproduced in the full dentures; this space should be maintained in subsequent sets of full dentures throughout life.

The Over-Opened Bite—If the bite is over-opened and the speaking centric space is eliminated or encroached upon, failure might result. (1) the patient will not be able to wear the dentures at all, (2) the patient may feel discomfort, (3) the teeth may click, or (4) sore spots may occur until the alveoli shrinks or the teeth wear and again create normal speaking centric space.

The Overclosed Bite—If the bite is closed more than normal (1) various symptoms of headches, (2) dizziness, or (3) ear symptoms may develop as shown by Costen.[21] Boos[22] demonstrated with his bimeter that opening the jaw relationship or closing it beyond the normal vertical dimension will reduce the maximum power of the muscles of mastication.

Transferring Vertical Dimension—The use of tattoo dots by the author[23] on the gingivae is the most accurate means available of controlling and transferring the vertical dimension from one set of dentures to another by measuring between the dots. By use of the phonetic system it can be determined whether the bite has closed from (1) absorption of the alveoli, or (2) wear of the dentures. The phonetic system will determine the vertical dimension in terms of millimeters which can be referred to later in the event the tattoo dots disappear or are displaced by surgery or the alveoli.

Case Reported—In the case used

[21]Costen, James B.: A. Syndrome of Ear and Sinus Symptoms Dependent upon Disturbed Function of the Temporomandibular Joint, Ann. Otol. Rhin. & Laryng. **43**:1-15 (March) 1934.

[22]Boos, Ralph H.: Intermaxillary Relation Established by Biting Power, J.A.D.A. **27**:1192-1199 (Aug.) 1940.

[23]Silverman, Meyer M.: Successful Full Dentures Through Accurate Centric Occlusion, DENTAL DIGEST **56**:494-497 (Nov.) 1950.

in this report it is found that when the patient pronounces one of the sibilants a speaking centric space of 3 millimeters is provided. This speaking centric space must be reproduced in the full dentures. In Figure 11 the full dentures are shown in centric occlusion with the anterior teeth set edge to edge on a horizontal plane. When the patient speaks and phonetic sounds bring the mandible to the speaking centric level it is imperative that the 3 millimeters of the speaking centric space of the natural teeth in Figure 7 be reproduced in the full dentures (Fig. 12).

Esthetic Requirement—If only the full upper teeth (Fig. 6) were lost and a full upper denture were placed against the lower natural teeth (Fig. 13) the upper anteriors must be set up with a similar overbite for esthetic purposes. It is necessary that the speaking centric space of 3 millimeters in this case (Fig. 7) be reproduced with the full upper denture against the lower natural teeth as shown in Figure 14.

Summary

1. A system of determining the accurate vertical dimension (centric occlusion) between the mandible and the maxilla is presented.

2. The vertical relationships of the mandible described are centric occlusion, centric relation (physiologic rest position) and speaking range with its various levels.

3. The closest speaking position of the mandible to the maxilla is called the speaking centric level.

4. A method of drawing penciled lines on the lower anterior teeth to denote the centric occlusion line and speaking centric line (closest speaking level of the mandible to maxilla) is shown. *The distance between the centric occlusion line and speaking centric line is called the speaking centric space. This speaking centric space is the means of measuring vertical dimension (centric occlusion).*

5. The speaking centric space of the natural dentition must always be reproduced in artificial dentures.

6. It is believed that the speaking centric space, when measured under the same conditions of posture, the same phonetic sound, and the same vigor of speech, should remain constant throughout life.

7. Determination of the vertical dimension through the use of phonetics and the speaking centric space is based upon the fact that certain phonetic sounds are made with the tongue close to the palate and other sounds are made with the tongue farther from the palate, and the higher the tongue, the higher the mandible, and the lower the tongue, the lower the mandible.

8. The speaking centric is the closest level of the mandible to the maxilla and the furthest forward position of the mandible during normal and rapid speech.

9. The important jaw relationships of full denture construction include the vertical, the anteroposterior, and buccolingual relationships. These relationships are obtained by the use of the phonetic system described.

3500 *Fourteenth Street, N.W.*

Leukemia in Radiologists

IT HAS long been suspected that radiologists are particularly susceptible to leukemia because of their long subjection to radiation. In the September, 1950 number of the *American Journal of Medical Sciences,* H. C. March reported that among American physicians who are not radiologists, during the five-year period 1944-1948 inclusive, only 0.72 per cent developed leukemia. During the same time, the incidence among radiologists was 4.84 per cent.

It would appear, therefore, that all physicians who work frequently with x-ray equipment should exercise great caution.

From *GP* **3**:31 (March) 1951.

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The SHELL CROWN—*An Anatomic Reproduction*

T. S. MALSON, D.D.S., Cleveland

DIGEST

The gold shell crown may be used in place of a full cast restoration and it is also useful when operating time is limited.

The position of the gold shell crown may be (1) the third molar area or any other short posterior tooth to be used as an abutment, or (2) it may be used in any tooth that is already supporting a clasp type of removable restoration calling for an accurate reproduction of size and form.

A step-by-step method of construction that will produce the desired results with an expenditure of the least amount of time at the chair is presented in this article.

Desirable Attributes of the Shell Crown

1. The first requisite of the shell crown is that it should fit the neck of the tooth exactly, not approximately.

2. It should have no rough or protruding edges and should not impinge on the periodontal tissues, but should be far enough under the free gingival margin to form a barrier to food.

3. The ideal for any type of restoration is an anatomic reproduction of the tooth form.

4. The size and form of all surfaces as far as the conditions will permit should be preserved. The V-shaped interproximal spaces should be carefully preserved as they are essential to the health of the gingival septa.

5. Retention of the size and form of the buccal surface is helpful in maintaining the normal massage of the soft tissues by food, and retention of size and form of the lingual surface is essential in speech and mastication.

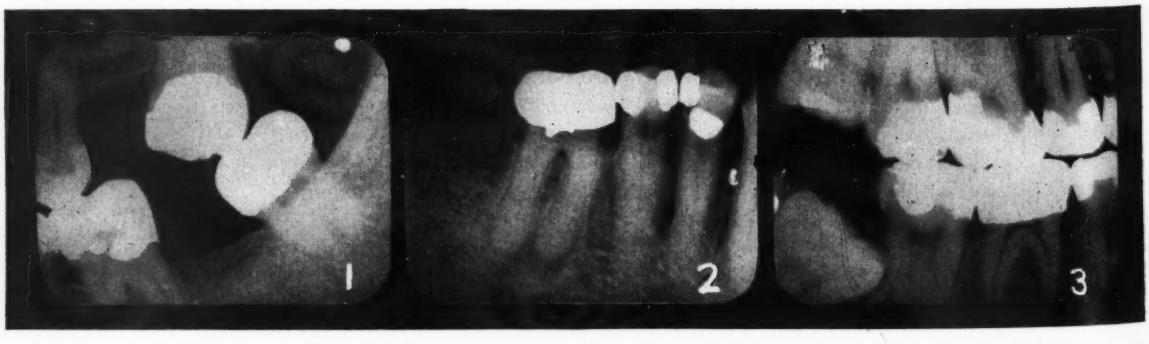
6. An accurate reproduction of a healthy anatomic occlusion helps to preserve the health of the tooth and surrounding tissues and adds to the efficiency of the tooth. If these points are not carefully observed, the tooth, its antagonist, or the surrounding tissues may suffer.

Technique

Preliminary Steps—1. Examine the gingival tissue and note the depth of the free gingival margin. If part of the tooth anatomy is missing, restore with gutta percha or other material that is easy to manipulate.

2. Take an accurate impression of the tooth to be crowned and run the impression of the tooth in heavy stone. If the tooth is isolated, or if there is enough recession of the soft tissue so that a good sharp impression of the entire gingival circumference of the tooth can be secured, the impression may be taken with a colloid or a hydrocolloid material. An impression taken in either of these materials *must be poured at once* for an accurate reproduction.

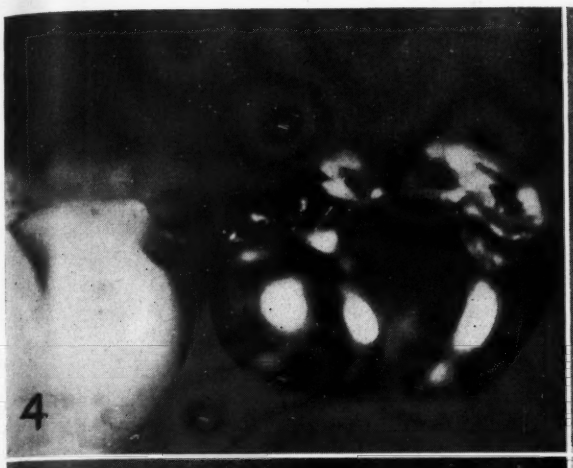
3. If an approximating tooth or teeth are present and the interproximal tissues are high so that an impression of the neck of the tooth in

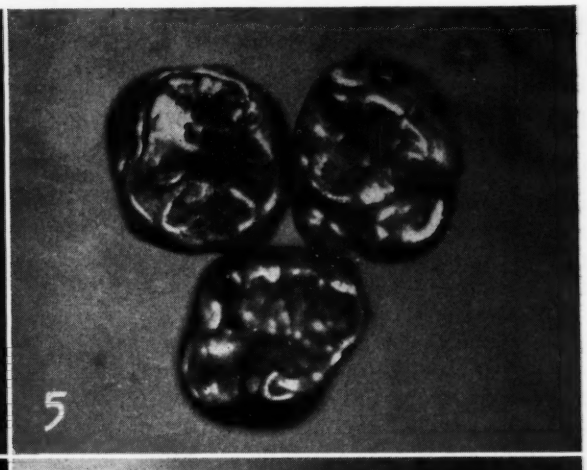


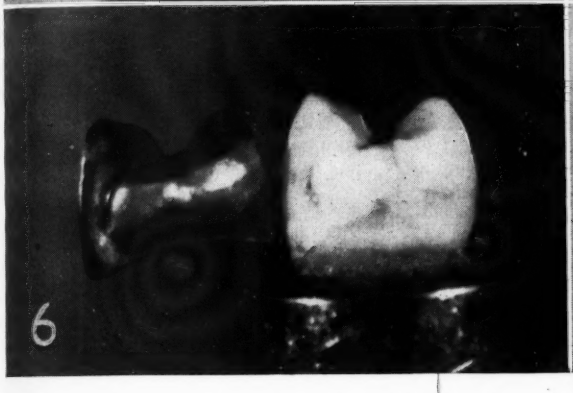
1. ***Shell crown stretched to fit.***

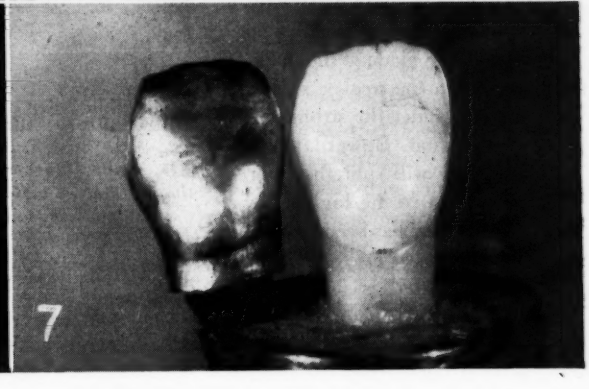
2. ***Shell crowns as they are found.***

3. ***Shell crown after twenty-three years of service. Note healthy bone structures.***









the interproximal area is questionable, the impression material to use is plaster of paris, or one of the gum-plaster impression materials.

4. In order to be sure of a satisfactory impression of the proximal side or sides of the tooth, a piece of copper or aluminum matrix material is trimmed to fit under the free gingival margin. Have the material burnished against the tooth at and below the contact point. Allow only a slight extension of the metal on one side of the tooth, just enough to provide a definite impression or slot in the plaster impression. On the other side, provide a sufficient extension of the metal to hold in the plaster when the impression is removed. The metal may extend slightly above the occlusal line on this side only.

Taking the Impression—1. Use an ordinary crown and bridge tray, seating the tray so that the plaster will be thicker on the side having the greater extension of the metal.

4. ***Lingual view of stainless steel shell crown. Reproduction of primary molar.***

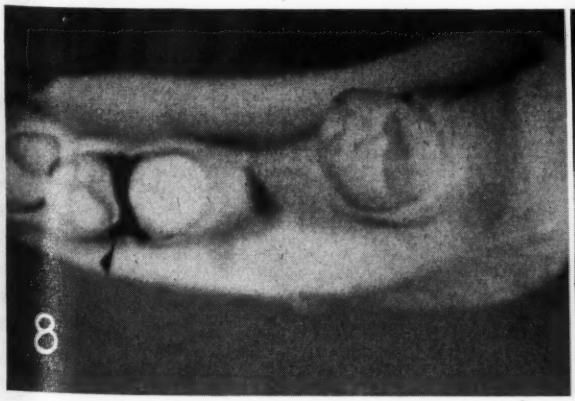
5. ***Gold shell crowns, occlusal reproductions.***

6. ***Gold shell crown; mesial view; bicuspid reproduction.***

7. ***Shell crown (labial view) cuspid.***

8. ***Matrix material trimmed and fitted to proximal surface of tooth.***

9. ***Hold impression down from top. Place finger under buccal flange and pull upward and out.***



Permit the plaster to set well.

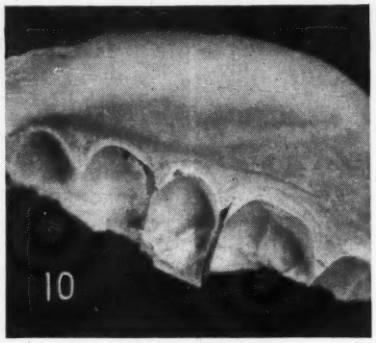
2. Remove the tray, leaving the impression on the teeth. Have the patient rinse the mouth well with cold water. This will wash out small particles of plaster that may be floating in the saliva and at the same time will permit water to seep between the impression and the tissues and make for easier removal.

3. Never use a knife or other instrument when removing an impression of this sort. The definite line of the break will be injured or destroyed so that the impression cannot be fitted together again accurately.

4. Hold the impression in place with one hand, placing the bulk of the pressure on the weaker side, and work a finger under the stronger side of the impression. Upward pressure with the finger will split the impression at the crest of the higher cusps.

5. The side that has been held down with the other hand may be removed and washed. If there is any saliva on the plaster it is advisable to wash the impression under running water as soon as it is taken from the mouth. This removes any small pieces of loose plaster and leaves a clean break as a guide to assemble the impression.

6. As an accurate reproduction of the tooth, preserving all the detail possible is desired, it is advisable to use the thinnest possible separating medium when painting the impression. Emulsified cocoanut oil (Drene Shampoo) has proved satisfactory as a separating medium.



10. ***Split impression, showing relation of matrix material to tooth.***

11. ***Carve cast at gingival.***

12. ***Cast in base; ring cover and top of swaging outfit.***

13. ***Impression ring over cast, showing relation of thin card material to ring and cast.***

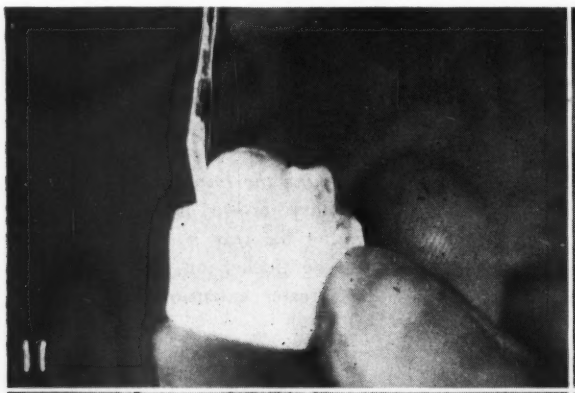
14. ***Split metal impression of cast.***

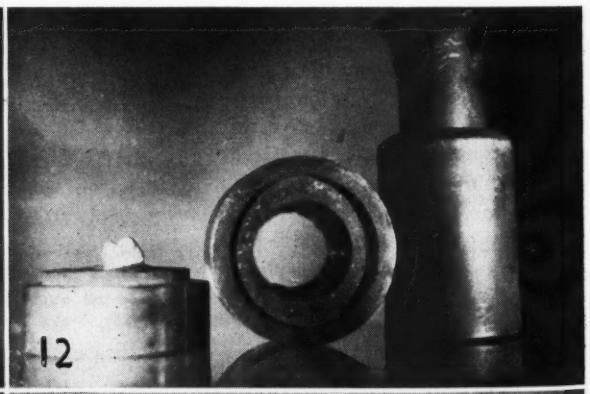
Succeeding Steps—1. When the cast has set, isolate the tooth to be crowned and carve it at the gingival. Use a straight instrument and let the crown be the guide. Extend only as far as the crown is to go below the free gum margin. This of course was determined by the character of soft tissue.

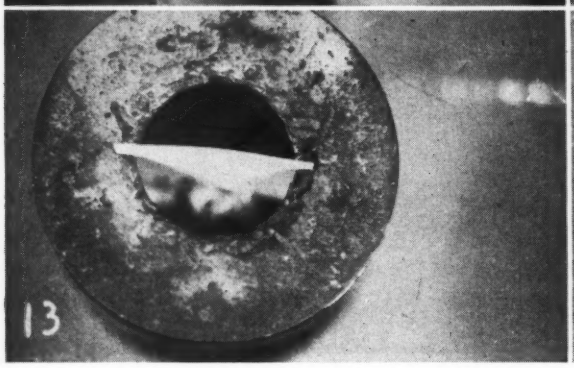
2. In carving, make the gingival extension definite and precise, preferably at a right angle to the axial line of the cast as an exact guide for trimming the crown after swaging.

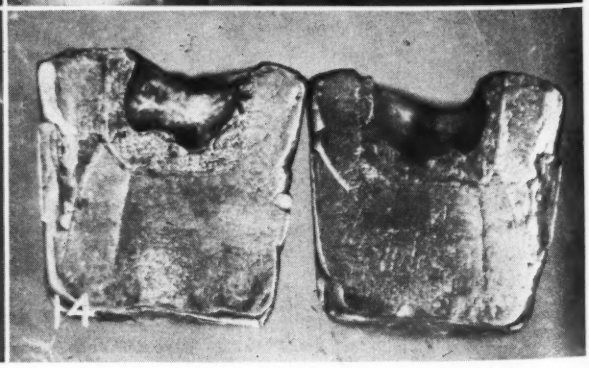
The Impression of the Cast—1. Any heavy tapered metal ring may be used as a container or tray for taking the impression of the cast. It is more convenient, however, to use one of the swaging outfits made for this purpose.

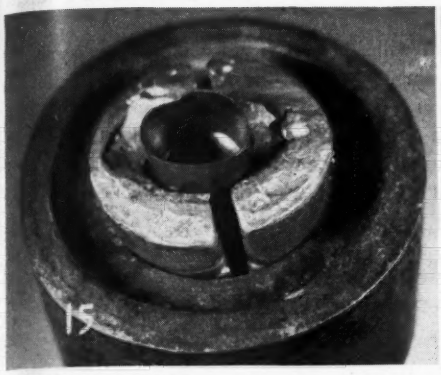
2. Sink the carved cast of the tooth in moldine, having the crown exposed. Cover with the tapered metal ring. Cut a piece of thin card to fit into the slots in the center of the ring and fit over the cast of the crown, allowing about 2 millimeters

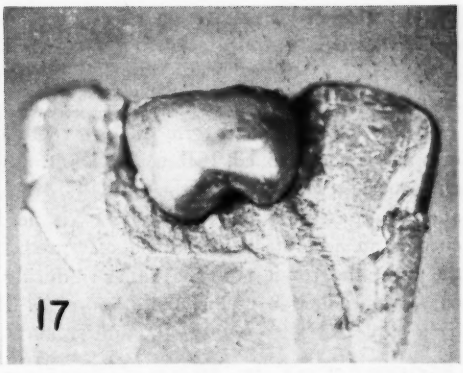












15. ***Gold shell in impression showing relation of metal halves before swaging.***

16. ***Swaged crown before surplus flange is trimmed.***

17. ***Completed shell crown in half of metal impression.***

of space between the cardboard and the cast. Place the cardboard so that there will be no undercuts when the metal impression is split.

3. Any low fusing metal alloy may be used for the impression. Melt the alloy and pour as cool as possible. Pour the melted alloy down one side of the ring so that it will flow through the space between the cardboard and the cast and up the other side of the ring. As the molten metal covers the height of the cusp, touch the molten alloy lightly with a cold metal instrument. This will crystalize the metal and prevent bubbles. Continue pouring immediately until the ring is filled.

4. When the metal is cool enough to handle, push or jar it from the ring and split the metal impression by placing a knife in the slot formed by the cardboard.

5. Select a 30-gauge seamless gold shell that will fit tightly when the halves of the metal impression are open 1 or 2 millimeters at the top.

Selecting the Shell—1. Few of the openings are round. If a shell is selected that will fit into the impression where the halves are closed, it means that gold must be stretched considerably in order to fit the contours. By selecting a shell broader than the opening, or nearer the size of the greatest circumference of the impression, the gold will adapt itself as the halves of the metal impression are closed: in most cases with no stretching of the gold at the cervical aspect.

2. When the shell has been selected, anneal it, and carve a short piece of soft wood to fit snugly into the shell.

3. Place the gold shell into the partly closed metal impression and force the metal impression part way into the metal swaging ring.

4. Place a small piece of unvulcanized or soft rubber in the shell, and with the aid of the soft wood and a hammer, force the rubber into the shell. This pressure will force the shell into the contours of the impression and at the same time force the metal impression into the ring and close the impression. Do not try to complete the swaging with one annealing. Anneal and swage two or three times.

Concluding Steps—1. By removing the metal impression from the ring and splitting it, it can easily be seen when the shell is completely adapted.

2. When the shell has been fairly well adapted to the impression, anneal and place a small piece of moldine in the bottom of the shell. Completely fill with rubber. Place in swaging ring and strike one or two blows with a heavy hammer.

3. When the impression is split this time it will be found that the shell has been forced into every detail, resulting in a crown exactly the same size and shape as the cast.

4. Trim the excess gold at the gingival, following the outline which will be clearly marked. Anneal again and swage as before to overcome any slight change that may have taken place when trimming.

5. Clean the crown in the pickling solution of choice and reinforce the cusps with solder.

6. The crown is now finished and is to be used as a guide in grinding the tooth.

Placing the Crown in Position—1. When all contour overlapping the gingival has been removed, the crown is tried on. When the crown is placed on the tooth and with slight finger pressure touches the gingival margin all around, have the patient bite into it slowly and force it to place.

2. If the technique has been followed precisely, there is no danger in having the patient force the crown to place. The extension of the crown under the gingival margin has been predetermined, and there is little possibility of error. As a precaution, watch the gingival tissue carefully for evidence of impingement.

3. The cusps have been reinforced with solder and will not change. The occlusion should be noted and the patient should close slowly so that closure out of centric may be observed. Under these conditions there is little chance that the crown will be forced into an improper position.

4. When the crown is forced into position in this manner it is actually stretched over the section of the tooth under the gingival margin, ensuring as close a fit as possible.

5. It is rarely necessary to repeat the last stage of the restoration a second time.

Summary

1. The exact size and form of the crown is predetermined. If the cast is an accurate reproduction of the tooth, and the crown in its outer circumference is an accurate reproduction of the case, the result must be an accurate reproduction of the tooth.

2. If the tooth was in occlusion, the crown must be in occlusion.

3. The crown at the cervical will be .010 of an inch (30 gauge) smaller on the inside than the neck of the tooth and must be stretched to a tight fit.

4. A bare minimum of chair time is needed at the first visit, and no protection is needed for the tooth during construction of the crown.

5. The actual construction of the crown may be delegated to a careful assistant or technician.

6. The finished crown is a valuable aid in the proper preparation of the tooth to receive the crown.

7. The method described permits an accurate check of each step.

8. The method is an excellent aid in construction of the stainless steel crown for deciduous teeth.

1038 *Keith Building.*

Repair of a Mandibular Bone Defect with Bone Chips

Captain Otto W. Wickstrom, MC, USN, and Commander R. W. Huebsch, DC, USN

Case Report

In the following case, in view of the large amount of bone destruction, the possibility of a pathologic fracture was apparent. To prevent this and to accelerate recovery a bone graft was performed. Cancellous bone chips were introduced into the bony defect at the time of excision of the cyst. Two complete surgical teams operated on the patient at the same time. At no time during the operation did the two teams contaminate each other. In order to prevent oral contamination of the bony defect, an extraroral approach was made.

History

A 38-year-old man was admitted to the Naval hospital complaining of a swelling of the right mandible for the previous six months. The mass had continued to swell until it had become apparent extraorally. The patient had had an infected lower first molar extracted six years before the swelling occurred.

Oral Examination—A large mass was revealed lateral to the right mandible which caused a bulging of the cheek in the molar and bicuspid regions. The mass could be palpated and outlined extraorally. Pressure applied to the area produced a crepitation of the buccal and lingual plates of bone. All teeth in the area were vital.

Roentgenographic Examination—A large area of radiolucency extending from the mesial root of the second molar to the symphysis of the mandible was revealed by roentgenographic examination of the lateral and anterior-posterior extraoral aspects of the right mandible. This had caused definite expansion and thinning of the bone on the superior and lateral borders. A diagnosis of radicular cyst was made and the patient was prepared for operation.

Oral Surgery

1. Under intratracheal anesthesia with nasal intubation an incision was made at the lower border of the mandible, extending from the angle to the symphysis. Two per cent procaine hydrochloride with epinephrine was infiltrated locally for hemostasis.

2. The soft tissues were reflected upward and the entire buccal plate of the mandible was exposed. The cyst, about the size of a hen's egg, was excised en mass.

3. Hemostasis was secured by gelfoam at the bleeding points in the bony cavity. The cystic contents were examined by the pathologist and found to be sterile.

4. A cancellous bone graft was taken from the left iliac crest, divided into chips, and gently packed in the bony cavity. The soft tissues were sutured over the defect and a pressure dressing was applied. A drain was inserted to prevent the formation of a hematoma.

Procedure in Elevating Bone Graft—1. An incision was made over the crest of the left ilium. The soft tissues were elevated and retracted and the periosteum was stripped from the bone.

2. The cortical plate of bone at the iliac crest was chiseled off, and a part of the cancellous bone was chiseled out of the bed.

3. This cancellous bone was divided into chips about the size of half a pea. The periosteum and soft tissues were sutured back in apposition.

Postoperative Course—1. The mandible was immobilized with Ivy loops and intermaxillary elastic to restrict the mandibular movements in order not to displace the bone graft by muscular activity.

2. Penicillin, a liquid diet, and moderate sedation for pain were prescribed. The patient noted parasthesia of his lower lip and chin, which was to be expected after an operation of this sort; otherwise the postoperative course was uneventful.

3. On the sixth postoperative day, the sutures were removed. The incision healed by primary intent. Periodic roentgenograms were taken and by the fifth postoperative month, the bone chips appeared completely homogeneous and viable.

4. The parasthesia of the lower lip persisted for three months after which all sensation was normal.

5. Soon after the operation, vitality tests of the molar and bicuspid teeth, whose roots were exposed in the cyst, were negative, but by the end of the second postoperative month they gave positive responses to cold, heat, electricity, and the bur, so they were not extracted.

Adapted from *U.S. Armed Forces Medical Journal*, **1**:1425-1429 (December) 1950.

The EDITOR'S *Page*

IN A STIMULATING article in this issue Russell C. Wheeler, the eminent dental anatomist and physiologist, examines the principles of surgery of the hard dental tissues. Operations upon the teeth preparatory to restoring tissue lost by caries are the most common surgical procedures known to man. Since the contributions of G. V. Black we have been disposed to standardize these operative procedures and perform them by rote without too much regard for the variables involved.

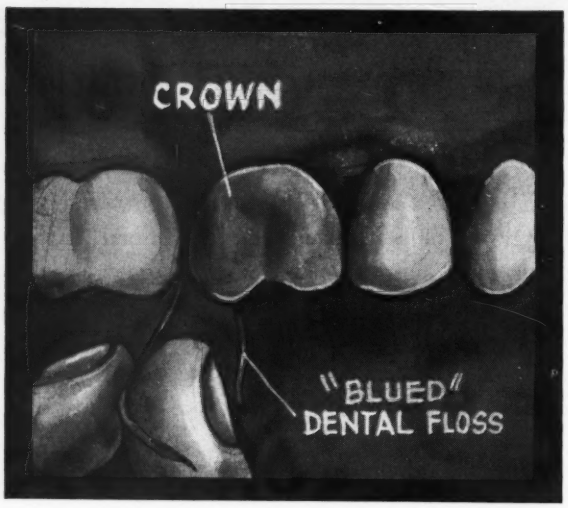
The extension of cavity margins to areas that are easily cleansed by food excursions or by brushing actions was a notable contribution made by Black. His box type cavity forms to receive gold foil and amalgam were likewise valuable additions to dental technique. The basic biomechanical principles involved in extension for prevention, resistance, and retention form, are still in force. In the light of additional knowledge, however, it is well for us to examine these principles.

We know that the tooth is a biologic entity and a living organ and that the dentine is an organic tissue that carries body fluids and possesses extensions from the central nervous system. The dentine is a part of the internal structure of the body. The first principle of good surgery is to conserve tissue. This applies to dental surgery as well. Tissue should not be needlessly sacrificed to fulfill a future exigency that may never come to be. Specifically, in the mouths of adult persons with a low index of susceptibility to caries there is no reason why tissue need be removed merely to fulfill the principles of extension for prevention. In these cases the removal of the active carious material and the simplest mechanical preparation of the tooth to retain a restoration are sufficient.

Although caries must be considered to be a disease we must look upon the disease as one that varies widely in virulence. There are "acute, white" forms characterized by rapid decalcification of the enamel and the breakdown of dentine into a spongy and leathery mass. At the other pole are "low-grade, dark" forms where the process is slow and the dangers of pulp involvement are minimal. In between these extremes are other degrees of the carious process. We should develop a grading system for caries as has been developed for the classification of malignant disease. The generic word caries covers a multitude of forms of the disease.

Malignant tumors are classified according to grade of malignancy and treatment is planned according to the classification: The more malignant the form, the more radical the surgery. The same principle should probably hold in dental surgery. The rampant caries of the post-adolescent must be treated different from the "slow" caries of the adult, both with regard to the amount of the tissue removed and the response of the pulp to the restoration. In rampant caries the disease attack has been so swift that the pulp has had no opportunity to defend itself by erecting a calcific barrier. In these cases if a metallic restoration is placed in the tooth immediately after the removal of the diseased tissue we may expect pulpal pain and often pulpal necrosis. The treatment indicated is for the insertion of a bland protective such as a zinc oxide-eugenol base and the insertion of one of the hard cements. In these cases it is often desirable to determine the trend of susceptibility before placing metallic restorations because in "malignant" caries there is frequently recurrence around the margins of the best restorations.

Doctor Wheeler is making a plea to evaluate dental caries as a disease process that varies from person to person and within the same person from time to time. There are different grades of susceptibility and different forms of the disease. There are peaks and valleys of activity and immunity within the life history of the same person. If our surgical procedures in treating caries are to be worthy of that name we must vary the treatment to fit the demands of a specific case. An empiric and standardized method in operative dentistry is to be deplored as it is in any other therapeutic procedure.



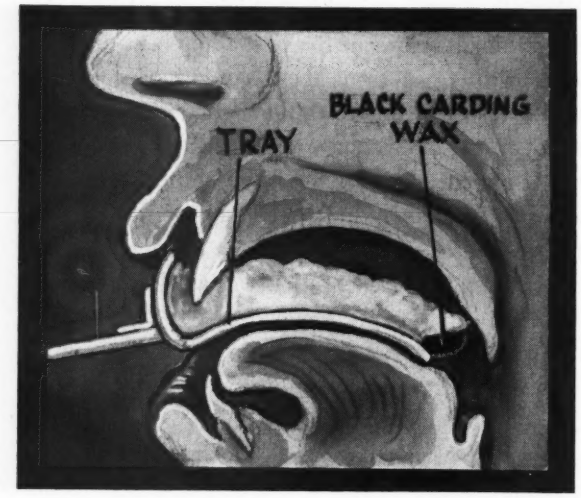
1

Clinical and Laborato

Determining the Proper Contact Point

Edward A. Reyer, D.D.S., Brooklyn, N.Y.

1. Dental floss covered with the Prussian blue from articulating paper may be used to determine the amount and position of the gold to be removed in the proximal contact adjustment of crowns and inlays.

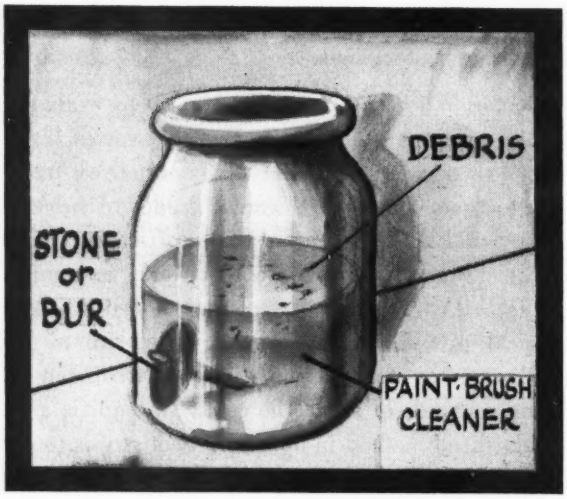


2

An Aid in Taking an Alginate Impression

Frederic L. Stern, D.D.S., Brooklyn, N.Y.

2. A strip of black carding wax is placed across the palatal periphery of a maxillary tray and the tray is then seated. The posterior edge is pressed against the tissues so that the soft wax conforms to the tissue contours. When the alginate is placed in the tray the black carding wax will keep the impression material confined to the tray and none will enter the throat.



3

Cleaning Burs and Diamond Stones

Morton Reiss, D.D.S., New York

3. Blood, amalgam, and other operating debris may be removed from burs and diamond stones by soaking them in a commercial paint brush cleaner from fifteen to thirty minutes.

READERS *are Urged to Collect* $10.00

For every practical clinical or laboratory suggestion that is usable, DENTAL DIGEST will pay $10.00 on publication.

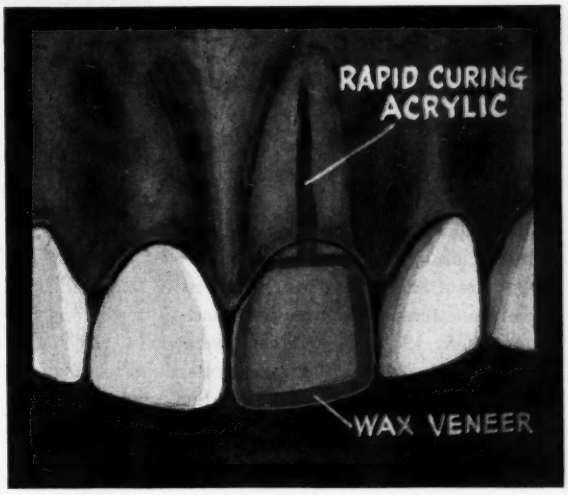
You do not have to write an article. Furnish us with rough drawings or sketches, from which we will make suitable illustrations; write a brief description of the

SUGGESTIONS . . .

A Crown Post Formed with Self-curing Acrylic

W. E. Rielly, D.D.S., Wilkes-Barre, Pa.

4. Pack one of the self-curing acrylics in the root canal that has been prepared for a dowel to support a crown. Withdraw the mass before it sets. The crown may be built up to proper veneer form with wax. The acrylic root portion and the wax crown portion are luted together, invested, and cast.



4

Matrix for Acrylic Gingival Restorations

Bernard H. Weltman, D.D.S., Brooklyn, N.Y.

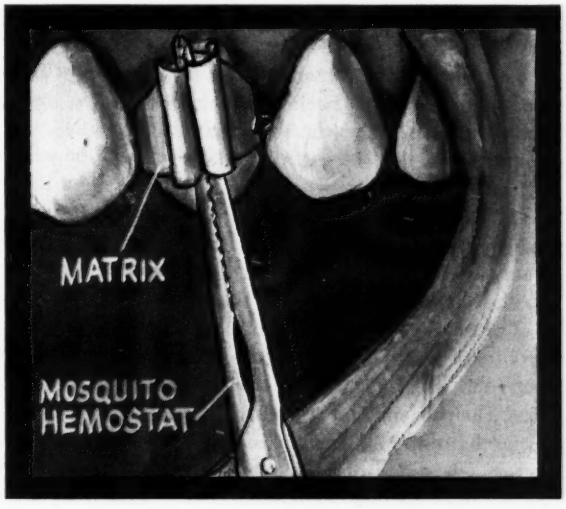
5. Cut down steel pen points of different sizes to conform to the gingival areas of different teeth. After the acrylic is placed in the cavity place the pen point matrix over the material and hold it in position with a stationer's steel spring clip.

5

Matrix for Acrylic Proximal Restorations

Eddie Epstein, D.D.S., Sherman Oaks, Cal.

6. Metal matrix material is adjusted to encircle the tooth. After the acrylic is placed in the preparation the ends of the matrix are grasped firmly by a mosquito hemostat and held in position for ten minutes.



6

technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time. Turn to page 326 for a convenient form to use.

Send your ideas to: Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

MEDICINE and the Biologic Sciences

The Health of the Young Executive

Industry has come to recognize that the toll of death and disability in the management group is excessive. It was recently reported by the Life Extension Institute that of 1,000 holders of life insurance policies in amounts of $25,000 or over who had received extensive examinations since January 1, 1938, 79 per cent were found to have physical impairments. High blood pressure accounted for 18.5 per cent and abnormalities of the heart accounted for 22 per cent.

Many executives in their early forties and fifties experience varying degrees of exhaustion. They have many disorders interfering with their efficiency. Fatigue seems to be an outstanding complaint in this group of men. The evaluation of this complaint is complex because it is largely subjective and must be evaluated on an individual basis.

It has been shown that in at least 40 per cent of these persons there is a more rapid disappearance of the sugar from the blood—a relative hypoglycemia. The brain is highly susceptible to changes in nutrition. When an inadequate amount of dextrose circulates in the blood, the brain does not function properly. The person becomes high-strung and easily fatigued and the body does not maintain its competence.

Executives with somatic symptoms are as a rule dependent men whose insecurities and feelings of inferiority are great. Their drives to succeed are a reaction to their intense fears of being inadequate. Such insatiable ambition often produces somatic symptoms in the (1) gastrointestinal, (2) cardiovascular, (3) respiratory, and (4) neuromuscular systems. Interpersonal relations appear adequate on the surface but the reactions to the family are frequently hostile.

The average business man, if he is in apparently good health, does not go to a physician of his own volition. The predominant reason appears to be that everyone thinks his or her organs are superior. The importance of periodic medical examinations is emphasized by the fact that there is a high incidence of asymptomatic organic disease.

Persons whose occupations are largely sedentary and primarily mental usually do not have good eating habits. Many an executive will rush to work without an adequate breakfast although he is in a field of endeavor in which food is of paramount importance because he is using his brain constantly. Breakfast is one of the most important meals of the day because in the morning most persons have fasted for 12 to 14 hours. Studies reveal that there is only enough dextrose reserve in the body for 12 hours.

In the midmorning these persons become a little tired and irritable because of the lack of food. Again they become irritable and tired in the afternoon. They become restless and their efficiency is definitely impaired.

Many an executive becomes a chain smoker. The primary effect of tobacco on the carbohydrate regulating mechanism is to raise the blood sugar level. Unfortunately, excessive use of tobacco has a secondary effect: it depletes the blood sugar level and causes a relative hypoglycemia. As a rule, a chain smoker is irritable, shows evidence of high tension and suffers from wear and tear on the heart muscle not only as an effect of increased tension on the coronary circulation but because the myocardium requires a normal amount of circulating dextrose for its maintenance.

The periodic medical examination is especially important for the executive. Also the need for psychologic and psychiatric counseling is important for long term efficiency.

Portis, Sidney A.; Zitman, Irving H.; and Lawrence, Charles H.: Exhaustion in the Young Business Executive, J.A.M.A. **144**:1162-1166 (*December* 2) 1950.

Gout

The time-honored concepts of gout seem to have been accepted without adequate confirmation. There appears to be insufficient differentiation between gout, primarily as a metabolic disorder, and gout primarily as an arthropathy.

Gout is a common disease, frequently missed because its manifestations are often atypical. Disturbance of purine metabolism, with retention of uric acid appears to be the primary mechanism involved. Allergy may play a causative role in the retention of uric acid even with adequate dietary purine restriction.

The volume of urine excreted in any twenty-four-hour period bears no consistent relation to the amount of uric acid excreted in that period. With average intakes of purine-containing foods there must be some retention of uric acid. This is verified by finding at postmortem examinations of gouty patients enormous deposits of urates in mesenchymal tissue.

There is a striking chemical similarity between uric acid and barbital. Thus, excessive uric acid saturation may account for many men falling asleep during afterdinner speeches.

It is suspected that a disturbance

of purine metabolism may be responsible for a good many of the vague (1) myalgias, (2) neuralgias, (3) lumbagos, (4) sciaticas, (5) muscular rheumatisms, (6) fibrosites, and (7) a wide variety of aches and pains in the muscles and joints of the body. Some gastrointestinal disturbances and proctalgias may actually be manifestations of gout in its broadest sense.

Diverse renal lesions may accompany gout. The incidence of hypertension and arteriosclerosis in gouty patients is higher than in normal persons.

In many patients the episodes of discomfort coincide with periods of uric acid retention. These periods are relieved by strict attention to dietary restriction of purine plus occasional small doses of colchicum. Many persons find that the ingestion of wheat leads to decreased uric acid excretion and presumably uric acid retention. A low-purine and wheat-free diet results in prompt relief of gouty complaints.

The contributing factors in the etiology of gout are (1) trauma, (2) emotional disturbances, (3) weather changes, and (4) dietary indiscretions. Allergy also plays a part. The hereditary tendency in gout may well be due to the inheritance of allergy rather than the inheritance of a disturbance of purine metabolism.

In the management of the gouty patient the search for and elimination of allergy is one of the most important phases. Prevention of uric acid retention, including limitation of purine intake is important. Maintenance of the general physical and mental health of the patient is imperative.

Bramigk, Fritz: Impressions of Gout, J. Michigan M. Soc. **49**:1297-1301 (*November*) 1950.

Vitamin Absorption with the Newer Antibiotics

There is a feeling among some men that the oral administration of aureomycin, chloramphenicol, or terramycin drastically retards or wholly inhibits absorption of vitamins from food or from orally administered vitamin concentrates. The oral administration of aureomycin is frequently followed by fissuring of the angles of the mouth, vaginitis, and inflammation of the rectum, similar to reactions seen in some patients given penicillin orally.

Scientific evidence is lacking that any of the newer antibiotics either retard or inhibit the absorption of vitamins from ingested food or from capsules and tablets of such vitamins administered by the oral route. Disturbances in the function of the colon do occur when aureomycin, chloramphenicol, or terramycin is given in appreciable doses. Bilirubin appears in the stool. This occurs because the antibiotics surpress the growth of, or actually kill, susceptible normally occurring bacteria in the colon and in other places such as the mouth and pharynx.

When this occurs, organisms which are resistant to the bacteriostatic or bactericidal effect of these antibiotics replace the normal bacterial flora. Naturally, the suppression of normally occurring bacteria, especially in the colon, brings about pronounced changes in the bacterial metabolism. This accounts for the disturbances so frequently noted in the stools and the elimination habits of patients who are receiving the newer antibiotics.

When aureomycin, chloramphenicol, or terramycin is being administered, lesions may occur on one or more of the mucous surfaces of the body. It has been established that in certain patients these lesions are produced by, or become infected with yeastlike organisms, of which *Monilia* are the commonest. Also, it seems that lesions of the mucous membranes may sometimes be due to vitamin B complex deficiencies when the newer antibiotics are being administered. Therefore, when mucous membrane lesions make their appearance, one should first establish whether these lesions are due to an infection with *Monilia* or to a vitamin deficiency.

There is increasing evidence that it is logical to administer by mouth the recommended requirements of vitamins (especially those of the B complex) as a supplement to dietary vitamins, to all patients who are receiving 2 grams or more of aureomycin, chloramphenicol, or terramycin per day for a period of five or more days. Patients receiving these doses of these antibiotics frequently do not have a normal vitamin intake from food because they are nauseated. Parenteral or intravenous administration is not necessary unless the patient has been very ill or his vitamin intake has been deficient prior to treatment.

Queries and Minor Notes: Antibiotics by Mouth and Vitamin Absorption, J.A.M.A. **144**:1225 (*December* 2) 1950.

Treatment of Poliomyelitis

There are many uncertainties over the best methods of treating poliomyelitis in the acute stage. It is not always easy to get scientific guidance on what should be done when poliomyelitis is diagnosed or even suspected.

Complete rest and muscular relaxation in the preparalytic stage increases the resistance of the spinal cord cells. It is important to bear in mind the possible harm done by long, anxious consultations, exhausting physical examination, lumbar punctures and removal to the hospital.

There may be some danger in transporting patients long distances for admission to hospitals. Some men maintain that long journeys in the early stages of the illness may tend to induce more severe paralysis.

Treatment should receive careful attention as there are still some uncertainties concerning the following: (1) whether lumbar puncture should be carried out in all cases, (2) whether the patient should be hydrated or dehydrated, (3) what is the proper use of sedation, (4) whether muscle-relaxing drugs should be administered, (5) what is the right

(*Continued on page* 324)

MINUTES that mean MONEY—your money!

YOU DON'T NEED TO BE TOLD about the supreme importance of *time* in dental practice. You know it only too well. That minutes mean money—*your* money. That your net income depends upon your productive time—depends upon avoiding wasting your time. Like nearly every other dentist, you are no doubt always eager for information about time-saving methods. So you will likely be glad to hear about this one. It is simple, time-tested, and costs but little.

YOU KNOW how much time it takes, day in and day out, to explain to patients the necessity for various procedures. Here is how not only to save minutes that mean money, but make your explanations much more graphic, much more convincing. The method has been pursued by thousands of dentists for nearly 20 years.

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USING A CHART that fits the case, you will find it easy to give a very brief chairside explanation. You save important minutes and the patient understands much more quickly. (And he will probably tell his friends about it.) Many dentists not only use *Visual Education in Dentistry* at the chair, they also keep at least one copy in the reception room. It is the best kind of reading for waiting patients.

THE COST of these 31 charts, most of them in color, may surprise you. The total cost is only $1 to DENTAL DIGEST subscribers. That is a little over 3 cents a chart. The coupon will bring one or more books to you quickly.

What are the charts?

Here are brief descriptions of not all but some of them:

Chart 1—Dental Conditions: This big full-color chart clearly illustrates 37 dental conditions from first-degree occlusal caries to pyorrhea pockets. Details are enlarged many times natural size.

Chart 2—Development and Eruption of Teeth: Seven color illustrations carry the process from age 2 through age 12.

Chart 3—The Progress of Tooth Decay: Three large full-color illustrations show a small cavity starting in the enamel and carry through to the final result: general systemic disease.

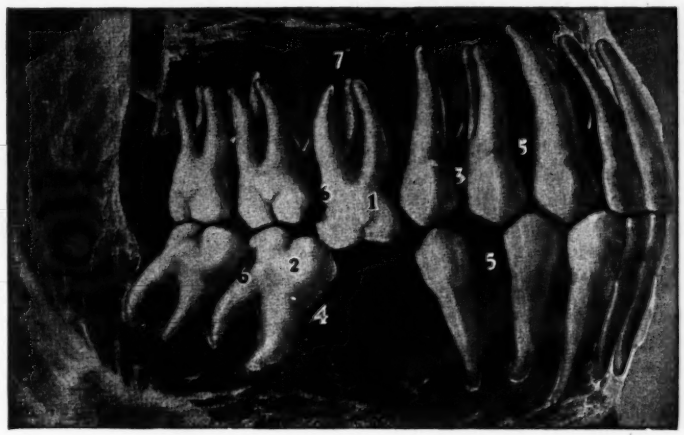
Chart 4—Why Construct a Bridge?: Dentists tell us that many patients have been convinced by this single chart—a full-color illustration of normal conditions contrasted with graphic proof of what happens when a needed bridge is not provided. This chart alone can be worth infinitely more than the cost of the chart book. Many dentists have found this to be true. (*See cut.*)

Chart 5—How Irregularities of the Teeth Affect the Face: Another full-color chart which quickly makes clear to parents the perils inherent in neglecting needed orthodontic treatment.

Chart 6—Modern Porcelain Restorations: Four full-color illustrations which patients can comprehend almost at a glance—making clear the advantages, and saving time you might otherwise be forced to use in presenting your recommendations.

Chart 7—The Expense of Poor Dentistry: Eight full-color illustrations make clear, even to an uneducated patient, the folly of cheap dentistry.

Chart 8—The Development of Root-End Infections: Four large full-color illustrations present facts that patients would otherwise not comprehend, and would accordingly neglect treatment.



Part of Chart 4, showing the patient what happens when a tooth is not replaced.

Chart 9—A Stitch in Time Saves Nine: Two big full-color drawings show the conditions prevented by timely replacement of a lost tooth with a bridge.

★ ★ ★

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The Circulation of the Blood

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The Action of Local Anesthesia

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How a Full Denture Fits

How the Loss of Teeth Affects the Face

The Danger from an Impacted Tooth

What Does the X-ray Show?

The Requirements of a Correct Restoration

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133 INDIVIDUAL ILLUSTRATIONS: There are actually 133 *individual illustrations*. Of the 31 charts, 20 are printed in full color, 8 in two colors; only 3 are in black and white. Every one of the 133 illustrations, every one of the 31 big charts was carefully planned to provide you with *time-saving*, convincing data for chairside use. And at negligible cost, $1 to Digest subscribers, $2 to non-subscribers, or $1 with a new subscription to DENTAL DIGEST. The coupon makes ordering easy. If you send it now, *Visual Education in Dentistry* will reach you quickly—and you can start saving minutes that mean money.

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(*Continued from page* 321)
treatment for urinary retention, and (6) what is the proper use of postural drainage and tracheotomy.

It is imperative to exclude meningitis for this requires immediate specific treatment. However, after this has been excluded, the less done in the preparalytic stage the better, apart from ensuring that the patient gets plenty of sleep.

A similar situation exists regarding treatment in the chronic stage of the disease. There are many different opinions, and reliable observations on the value of various methods of physiotherapy are strikingly few.

Editorial: The Treatment of Poliomyelitis, Internat. M. Digest **57**:372 (*December*) 1950.

Lipid Pneumonia from Oil

Lipid pneumonia can truly be classified as a man-made disease. The condition can be caused by the oil in nose drops, in vitamins, or in a mineral oil laxative.

In young children, cases of lipid pneumonia are understandable in view of the fact that the administration of oily vitamin preparations is frequently associated with struggling and possible aspiration. Most fish oils and free fatty acids are of the more irritating types for pulmonary tissues.

Mineral oil, being a saturated hydrocarbon, is not assimilable. It cannot be digested in the body and, consequently remains in the lung indefinitely, except for small amounts which appear in the sputum. Factors that predispose to the aspiration of oil are: (1) anatomic defects in the mouth, palate, tongue, larynx, or esophagus, (2) neurologic disturbances that interfere with swallowing, (3) the use of forced feeding, and (4) the fact that mineral oil, being bland, does not initiate the cough reflex.

When mineral oil reaches the dependent portions of the lung, it first remains free in the alveoli but is later picked up in droplets by the macrophages. Some of the mineral oil can be disposed of in sputum and a small amount reaches the lymph nodes. However, the bulk remains indefinitely in the lung where it causes the development of fibrous tissue. This renders the lesion detectable by roentgen ray. The lower lobes, particularly the right, are most likely to be involved.

The abnormal lung is a fertile soil for repeated attacks of bronchopneumonia. Such attacks may eventually result in death.

Since oil cannot be recovered from the lungs, prevention is the only treatment. Laxatives containing mineral oil should not be used, nor should oily nose drops be instilled in the respiratory tract.

Baron, E.: Lipid Pneumonia Due to Use of Mineral Oil as a Laxative, Virginia M. Monthly **77**:448-451 (*September*) 1950.

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Contra-Angles

Dentists and Their Hobbies

Unless one has a hobby he is considered by many of his friends to be only part human. Many hobbyists work harder at their avocation than they do at their business. I know dentists who have the fanciest and most expensive hobby gadgets that money can buy but still carry on their practices with collapsed equipment and abominable instruments.

The theory of the hobby is to gain release from nervous tension and secure freedom of mind; to find a pleasurable outlet that will take interest from *making* a living to just *living*. It is supposed to be recreational and relaxing. It is anything but that with some of the people I know. Some of my friends wear their eyes to red-eyed bleariness poring over their stamp collections. I know others who hack their earning hands to bleeding shreds scraping and refinishing old furniture or constructing ugly new pieces.

The photographers are the worst. A well-known dentist in a northern Ohio city needs a truck to transport his photographic equipment. On a few occasions I have travelled with this gentleman. I have served as a sort of auxiliary coolie, porter, and bellman in his behalf. This hobby I did not enjoy. This gentleman is also a sheep raiser of distinction who entertains his guests by handing them a pitchfork at hot haying time or else sets them to carry on with a variation of the same tool in his sheep barns. This versatile hobbyist is, of course, Howard Hartman.

We all have feverish antique hunters among our friends who comb the back trails looking for discarded and worn-out dishes and furniture that have escaped the secondhand stores. I have a mild form of this disease myself. I have ferreted in sheds, attics, and junk piles among the cobwebs and rodents looking for the kind of things my grandmother discarded years ago. In fact, I have a couple of old school bells that I picked up on my travels—but God knows why.

The painters are multiplying in their hobby fervor. There is an art store nearby that does a furious business supplying canvas, brushes, and paint to people who have submerged longings to emulate Mr. Winston Churchill. I, likewise, have had symptoms of this malady. I have tried my hand at copying from established and admirable artists. This is considered to be a degraded behavior, akin to cheating at cards, and after looking at my creations and comparing them with the originals, my punishment is severe enough. I have also tried the blindfold-throw-on-the-canvas-with-a-broom technique. Although

CLINICAL AND LABORATORY SUGGESTIONS

(*See pages* 318 *and* 319)

Form to be Used by Contributors

To: Clinical and Laboratory Suggestions Editor

DENTAL DIGEST
708 Church Street
Evanston, Illinois

From: _____

_____

Subject: _____

Explanation of Procedure:

Sketch:

Suggestions submitted cannot be acknowledged or returned.

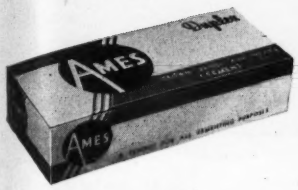
$10 will be paid on publication for each suggestion that is used.

this form seems to win awards in art shows, I have never produced anything except a jaundiced nightmare in atrocious color. I am best at landscapes and outdoor scenes, not so much because of the subject matter but because of the ancillary attractions: soft grass to sit upon and sturdy trees to lean against. My masterpiece in this field, if you will pardon my boasting, is entitled "Wolf in the Hammock" which is a composite portrait of my colleague, Mass, publisher of DENTAL DIGEST, and myself. "The wolf," of course, is strictly past tense for both of us but "the hammock" is very much present and future. When we visit back and forth with the Massols the battle to be first in the hammock is our most strenuous activity. This is *our* hobby.

Raising pretty flowers or dogs makes some sense to me except that there is so much work involved that takes one away from the hammock or the rocking chair. Flowers nowadays require regular hormone treatments to blossom fully and even dogs suffer from nervous breakdowns. There is too much responsibility involved in these hobbies.

And speaking of rocking chairs—my wife's grandfather knew me better than I thought he did. The first time I met him he told me what he would leave me in his will. It is a rocking chair with a wide desk-like side arm that can be used to write upon, to hold a book, or a highball. Hammocks and rocking chairs are for me. If I were to take up an *active* hobby it would be to sledge-hammer to silence all clocks and telephones and to tear to bits anything that looked like an appointment book or a timetable. Down with the tyranny of time!

Some psychology prober suggested that having a hobby is a pleasant way to keep one's frustrations, obsessions, and such miserable things under control. That may be true for some people but I wish to advocate the case for the millions who will go nuts faster with a hobby than without one. I am thinking of the feeling of insecurity and inadequacy, and the malignant maladjustments that may come



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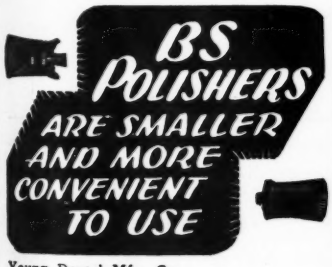

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from not having the proper stamp in a collection, from not having a photographic or painting technique as good as Peter Stackpole or Picasso. When the fierce competitive spirit enters the hobby field the fun flies out for many people. I want to state the case for those voiceless millions who feel they get enough competition and work in their vocations and who want no avocation that will make life one bit more strenuous or confusing.

Naturally, I expect ridicule and abuse for this heresy but I will be glad to print any comments received from the hobby downtrodden who feel the same way. Well, even if you *are* a hobbyist we will be glad to hear from you—if you are not too scurrilous.—E. J. R.

Insensitivity to Pain

THE FUNCTION of the sense of pain is protective. It serves to warn of damage and urges the organism to defensive measures. There is a distinction between *perception* of pain and *reaction* to pain. Perception of pain may be evaluated in terms of (1) quality, (2) intensity, and (3) temporal aspects. Reaction to pain is manifested by such symptoms as (1) tachycardia, (2) panting, (3) bowel disturbances, (4) anxiety, and (5) prostration.

The Dual Aspect of Pain

The distinction between perception and reaction to pain is apparent and is easily appreciated in the case of heat, light, touch, cold, and olfactory perception. The reaction pattern of the organism to noxious stimuli has many components. Reaction to pain is modified by conditioning experiences, such as the excitement of a game or the apathy that accompanies tissue damage during certain religious and mystic practices.

Absence of Behavioral Responses Rare—1. Three children with lack of reaction to pain rather than absence of pain as sensation are described. The children could appreciate light touch and could distinguish between warm and cool test tubes and between the head and point of a pin. They were, however, indifferent to damaging stimuli.

2. A young man who had almost complete insensitivity to pain and who experienced attacks of unconsciousness beginning in childhood, is reported. The measurement of pain threshold in the patient confirmed the presence of a greatly elevated threshold for both superficial pain and deep somatic and visceral pain. Immersion of the hand into ice-cold water failed to produce any pain. However, definite, almost excessive,

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pressor effect on the arterial blood pressure was noted.

3. In an otherwise apparently normal girl, 7 years old, the usual pain responses could not be obtained by any stimulation. (1) She was able to distinguish sharpness from dullness, (2) the senses of touch, vibration, position, and gnosis were normal, and (3) she had incurred innumerable cuts, bruises, and infections but had never mentioned experiencing pain. Careful study excluded any gross neuroanatomic lesion. Mental deficiency was excluded by psychometric test results and her active alert responsiveness.

Suggested Explanation—Two theories are advanced to explain indifference to pain: 1. There exists a congenital structural defect with incomplete neural connections and communicating fibers in the postcentral area with consequent inability to organize the complex concept of pain. 2. There is no neurologic defect, but there is indifference to pain which represents an aphasic-like disturbance. It is also possible that there is present a combination of these two mechanisms.

Results of Experimental Pain Stimuli Studied

The patient studied presented no evidence of neurologic or psychologic deterioration and there was available reliable background information from hospital records dating to the time when the patient was 21 months old. Encephalographic studies revealed no pathologic wave forms.

Method Used—1. The patient was subjected to a series of experimental studies with various pain-producing stimuli used and to another group of experiments in which a variety of stimulating conditions of a nonnoxious nature was used.

2. The physiologic responses to these varied stimuli were measured by continuous readings of the blood pressure, heart rate and respiration. At the same time all relevant behavioral reactions were observed.

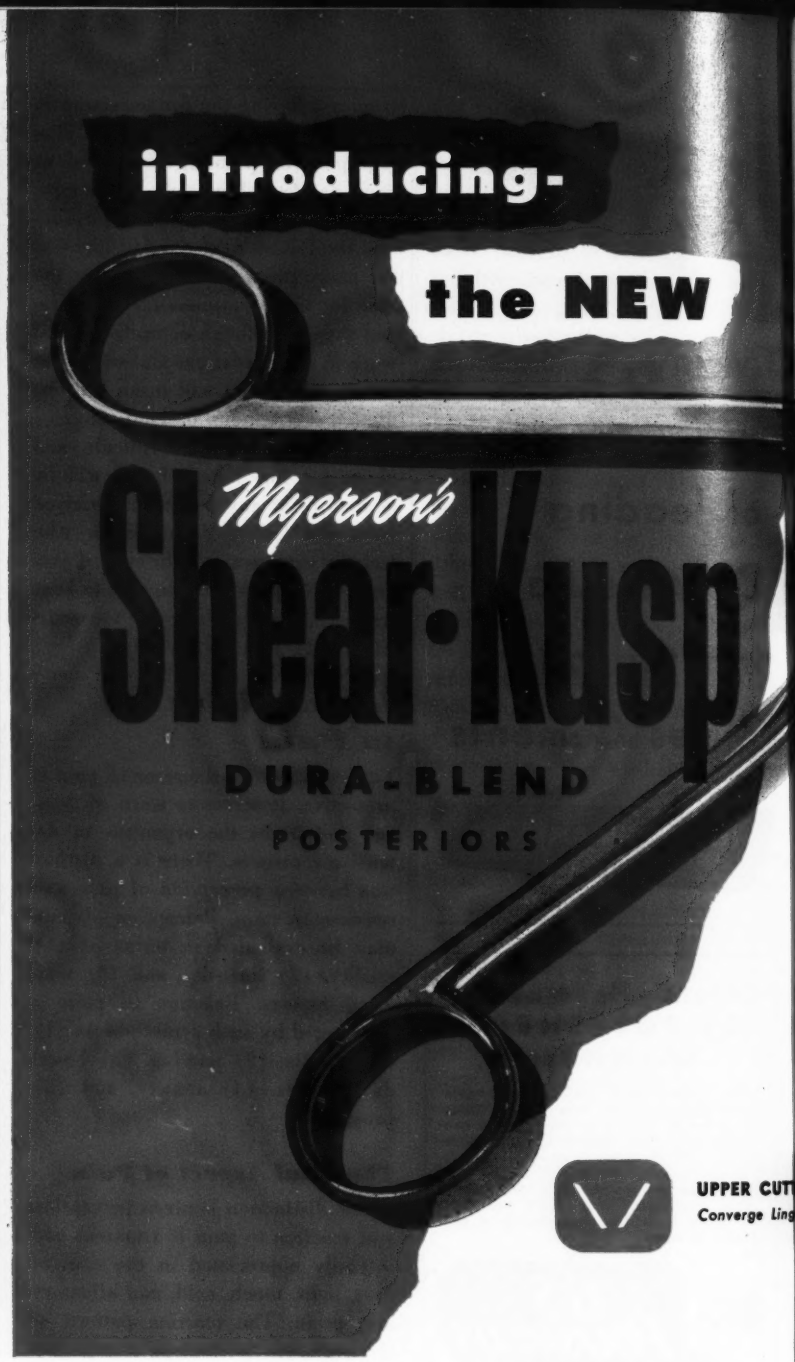
3. At no time during any of the experiments in which noxious stimuli were used did the patient report a sensation or feeling that could be interpreted as a report of pain. Consistent with this was the complete absence of observable signs of painful experience.

Results Inconclusive—1. The psychologic examination and interviews, conducted over a period of three months, failed to disclose any evidence of a disorder that could plausibly result in this picture.

2. A histologic study of the peripheral cutaneous innervation did not reveal anything abnormal.

3. The mechanisms involved and the possible localization of a defect or anomaly in the brain in this puzzling syndrome have not been discovered.

Adapted from Editorials and Comments, *Journal of the American Medical Association* **145**:406 (Feb. 10) 1951.



Thrush in Infants

Causes—Thrush is caused by the fungus *Monilia albicans* which is saprophytic to man except in conditions specially favorable to it. Such conditions occur in the mouth of the

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young infant and the vagina of the pregnant woman, for both possess acid secretions with an unusually high pH close to the optimal for this organism. This is the principal reason for the high incidence of oral thrush in early infancy and vaginal thrush in pregnancy.

Lesions Uncommon After Infancy—It has been demonstrated by repeated routine swabbing of the mouth in newborn infants that infection of the mouth with *M. albicans* in the neonatal period almost always causes thrush lesions within two to eight days. The much higher incidence of bacteriologic thrush than of recorded clinical thrush at this period of life is due to failure to recognize minor degrees of the latter. After infancy, however, infection of the mouth with this organism seldom if ever causes thrush lesions unless there is pre-existing disease, such as herpetic stomatitis. The thrush fungus has been isolated in 14 per cent of 1,000 healthy adults, none of whom developed thrush.

Characteristics—1. The characteristic grayish-white adherent colonies and placques of oral thrush are most often seen on the tongue, but usually affect several parts of the buccal cavity.

2. As a rule the lesions cover only a relatively small part of the mucosa at the height of the disease; there are no symptoms and the infection gradually subsides.

3. Such a benign course should never be assumed for the disease may progress and cause fatal lesions in the alimentary tract or elsewhere. There is thus a potential danger in every case of thrush, particularly in premature and debilitated infants.

Extrabuccal Thrush Lesions—1. It is impossible to estimate the incidence of extrabuccal thrush lesions, but in post-mortem examinations of infants they have been shown to be quite common. In severe cases of oral thrush the infection is more likely to spread down the alimentary tract than in mild cases and to reach either the pharynx or esophagus or both.

2. The diagnosis of extrabuccal thrush lesions is a matter of conjecture and can generally be made with

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certainty only at necropsy.

3. The presence of oral thrush which may require careful search, or the demonstration of *M. albicans* in films or cultures made from oral swabs or from the stools, should at least suggest the possibility of this infection in ailing infants in whom no other cause of illness can be found.

Symptoms

1. Severe thrush causes ulceration of the underlying mucosa with consequent secondary infection by pyogenic organisms.

2. In esophageal infections a pseudomembrane may be formed. The lesions then become acutely inflamed, and painful if in the mouth, larynx, or esophagus.

3. The infant looks ill, loses appetite, and may have difficulty in swallowing if the pharynx and esophagus are affected.

4. Regurgitation is another common feature of esophagitis, and vomiting (sometimes associated with hematemesis), dehydration, and loss of weight may also occur.

5. In such severe infections vomiting matter may be aspirated by the infant, with fatal results, either from sudden suffocation by occlusion of the main air passages or more often from aspiration bronchopneumonia.

6. The thrush fungus can usually be found in inhaled foreign matter and inflammatory exudate, but seldom invades the bronchopulmonary tissues.

7. Infection of the middle ear is an occasional complication.

Metastatic Process—1. In large thrush lesions there is deep penetration of the mycelial strands with invasion of lymphatics and venules and, rarely, of surrounding structures.

2. Organisms thus gaining access to the blood stream usually perish, but occasionally set up metastatic lesions in distant parts of the body.

3. Several cases of *M. albicans* meningitis have been described and two instances of metastatic thrush lesions in the kidneys reported.

4. The complication of empyema in two infants with thrush has been reported and it was shown that there had been a direct spread from the esophagus by penetration of the mycelium through the esophageal wall and parietal pleura.

5. Septicemia and pyemia caused by secondary pyogenic invaders of thrush lesions, usually *Staphylococcus aureus*, are probably more common than metastatic lesions.

Incidence Higher in Nurseries—1. Thrush is also much higher in bottle-fed babies than in breast-fed infants because feeding utensils may be contaminated.

2. The organism has been isolated from pooled breast milk used for feeding premature infants, and from the fingers of nurses engaged in feeding infants. Aerial dissemination of the spores rarely occurs.

3. The slightly higher incidence of oral thrush in the infants of mothers with vaginal thrush may be due to direct inoculation of the mouth at birth, but is more likely to be caused later by indirect infection from the hands of the mother.

(*Continued on page* 332)

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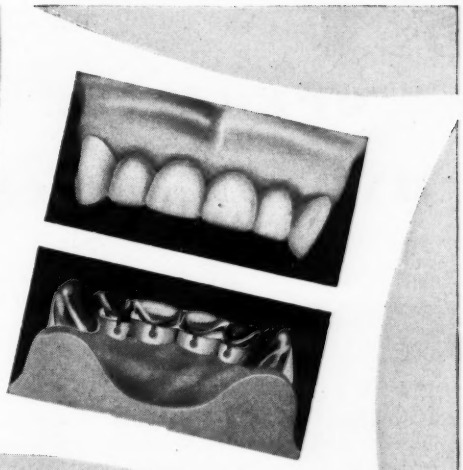

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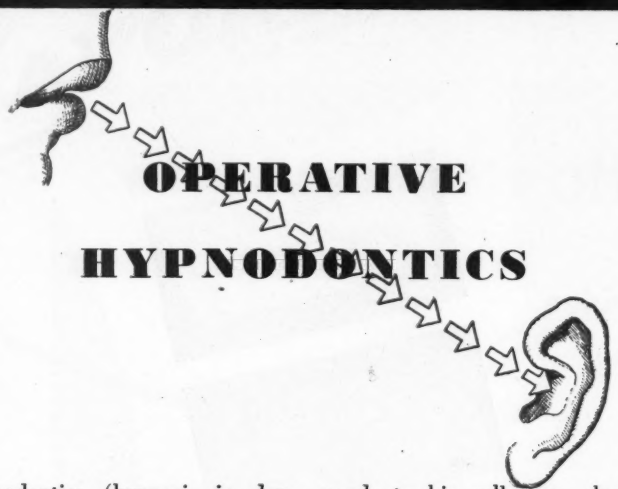


OPERATIVE HYPNODONTICS

Hypnodontics (hypnosis in dentistry) is claiming the attention and interest of more and more dentists. Doctor Aaron A. Moss reports that there is a constant growth of membership in both the American Society for the Advancement of Hypnodontics and the American Society of Psychosomatic Dentistry.

He has carefully outlined the best method of procedure under hypnotic trance and has answered many questions that the dentist would want answered, in an article for Oral Hygiene and in his book, "Hypnodontics or Hypnosis in Dentistry."

Whether you approve or disapprove this new method of anesthesia-analgesia, you will be interested in Doctor Moss's carefully detailed explanations. His splendid article won the Oral Hygiene award for the best feature published this month.

★ ★ ★

There's a new School of Oral Hygiene. It was recently established at Fairleigh Dickinson College in Rutherford, New Jersey. The initial class is composed of eleven students who have finished their first-semester training and are now ready for clinical practice. There is also a night school program to augment the full-time day school. Doctor Roy D. Ribble of New York City is dean of the school.

★ ★ ★

"Speak Cautiously, Your Public is Listening," warns one of our authors, M. A. Travascio, who explains that a dentist must of necessity assume the role of high dental authority to his patients. His casual remark can do much good—or perhaps some harm. Even in dental society meetings, his words to his colleagues should be carefully chosen lest newspaper reporters misconstrue them or quote them out of context. It is a timely warning which could save many a dentist embarrassment.

★ ★ ★

"All Dressed Up and No Place to Go!" is Doctor F. G. Robeson's continuation of the subject presented by Doctor A. S. Dunn in the February issue. He emphasizes that, after a dentist leaves dental college, his worries will not be concerned with a grade of A, B, or C, but rather how he will meet the rent payment when it is due. He pleads for training not offered by our dental colleges: development of practical business ability and a working knowledge of psychology.

★ ★ ★

Like horses? So does Doctor Leo Pruden of Santa Monica. He raises golden Palominos on his Malibu Mountain ranch. His story is an exciting one of a dentist who has found a perfect hobby and avocation. His horses have won many trophies and ribbons, and he looks forward to the time when he can devote his whole attention to their care.

★ ★ ★

California's dentists and other professional men may be compelled to file an affidavit of loyalty, the same oath all state employees now take. There's a bill before the Senate that would make it obligatory. Harold Ashe reports on this proposed legislation.

★ ★ ★

The regular departments and features make good reading for these hot summer months.

(*Continued from page* 330)

4. There is no doubt that cross-infection resulting from faulty nursing technique is the principal reason for the high incidence of thrush in nurseries.

Treatment

1. Where the danger of cross-infection exists the infants' mouths should be inspected carefully daily, and those who show the earliest sign of thrush, as of any other infection, should be isolated immediately.

2. The application of gentian violet, 1 per cent in aqueous solution twice daily, in the early stage of oral thrush usually checks the spread of the lesions and causes their disappearance within a week.

Adapted from *British Medical Journal* No. **4694**:1430-1431 (Dec. 23) 1950.

Enamel Etching Under Orthodontic Bands

Charles F. Bodecker, D.D.S.

Decalcification of the enamel tooth structure under orthodontic bands, generally referred to as etching, is one of the hazards of orthodontic therapy and is of particular annoyance and disappointment to the patient when it occurs in the anterior teeth.

Causes

Of the various causes that have been ascribed for this enamel etching, Gross[1] dismisses all except that of poorly mixed cement. Gross's conclusion is that if the cement is properly mixed, the decalcification of the tooth can be avoided.

He states that the enamel is affected only during the time when the cement is setting and that the acid may be neutralized by the saliva because "Saliva contains sufficient tricalcium phosphate to prevent decalcification at the lower pH levels."

Logic not Clear—1. How can tricalcium phosphate, or any other agent, neutralize the acid present

[1]Gross, David J.: The Solution of Enamel as Affected by Cement under Orthodontic Bands, New York State J. Dent. **17**:233-234 (May) 1951.

under a cemented band since saliva obviously can be beneficial only to those areas which it can reach? 2. Why are not all banded teeth etched? 3. Why are some teeth more susceptible to etching than others? 4. Is it possible that teeth which are more susceptible to etching are also more susceptible to dental caries?

A Variable Factor— Gross found no etching of the enamel in the ten banded teeth which comprised his experiments. The fact that etching does not occur regularly implies the presence of some variable factor. Gross believes this variable to be the proper or improper method of mixing cement but concedes that acid is present even in a proper mix.

It is possible that the variable factor is enamel resistance and that when resistance is low, etching occurs. This point certainly should be determined and it would seem that such determination can best be made in an orthodontic clinic.

Suggestions to Orthodontic Clinics

1. Select all cases in which etching of the teeth has occurred under orthodontic bands and grade the degree of etching into three types, as mild, considerable, and excessive.

2. Take an equal number of patients of comparable age where no etching has occurred.

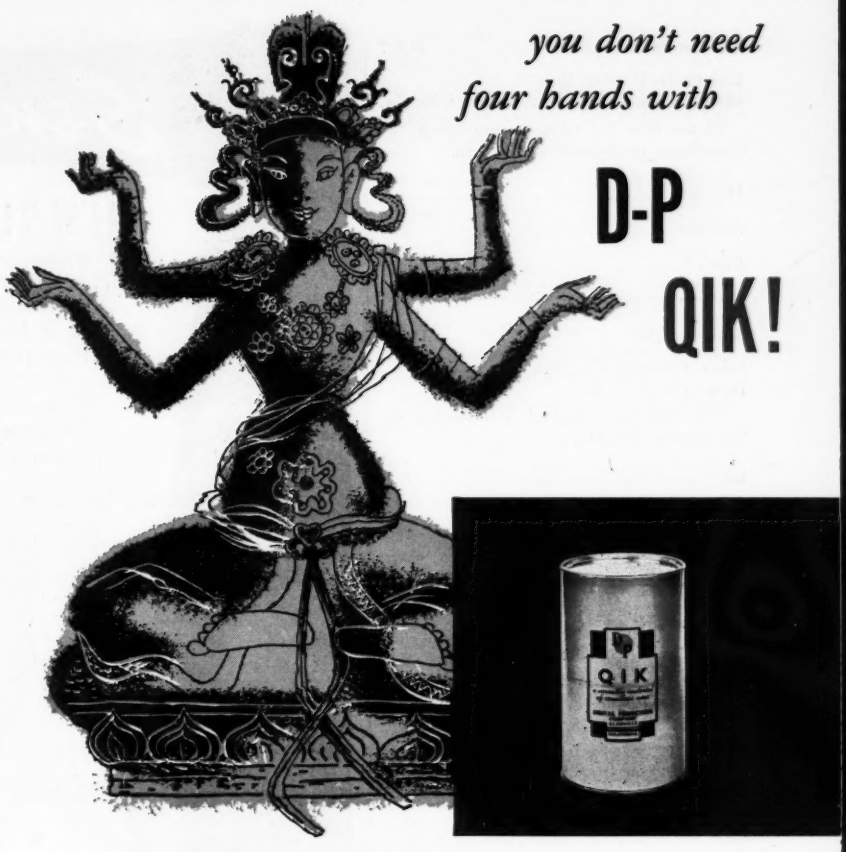
3. Tabulate the degree of carious destruction of the teeth in both groups of patients, preferably by a caries index, based on the estimate of carious and restored tooth surfaces —not teeth—and determine whether or not the tendency to etching is related to a higher than average susceptibility to dental caries.

Conclusions from Observations

1. If it is shown that enamel etching is more common in mouths with teeth of higher caries susceptibility we shall be one step nearer to a discovery of the exact cause of this condition.

2. The orthodontist will have had warning to exercise the utmost precautions with patients of this type.

(*Continued on page* 336)



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(*Continued from page 332*)

3. Patients and general practitioners will realize that it is the character of the enamel which is responsible for etching and not the orthodontic technique.

4. Orthodontists must face this problem and discover the causes of this hazard in therapy. Dental science cannot by-pass it with a complacent reference to the "scars of orthodontic therapy."

Adapted from Editorial, *American Journal of Orthodontics* **37**:387-388 (May) 1951.

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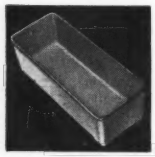

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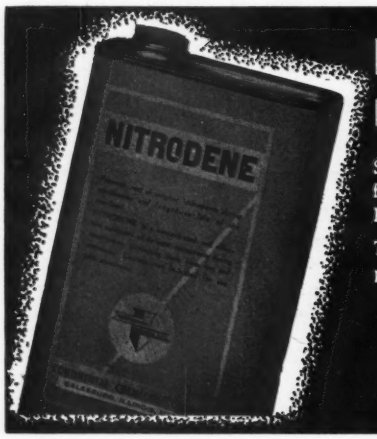

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